ovember-December, 1956

OCIAL ENCES

POLICE

To the "Pen" with Pencil • Police and Human Relations • Photography in Coroner's Office • Motor Vehicle Seat Belts • The Striagraph • Rights of the Subject in Lie-Detector Interrogation • American Bar Foundation Survey • Moral Health of the Nation • Mathematical Methods Used in a Manslaughter-by-Automobile Case

Journal Devoted to the Professional Interests of All Law Enforcement Personnel

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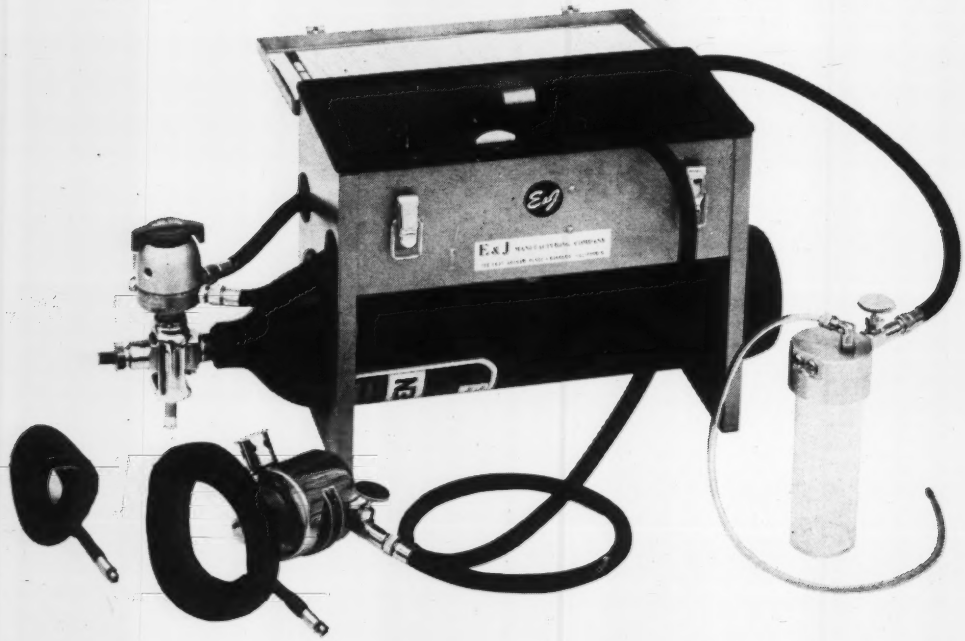

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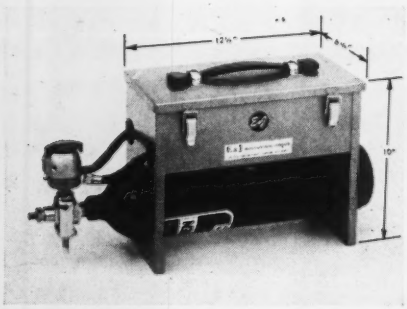

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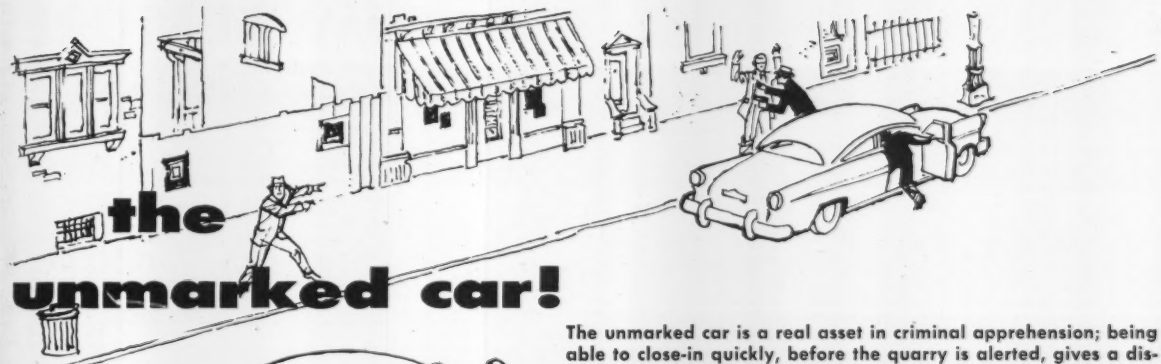

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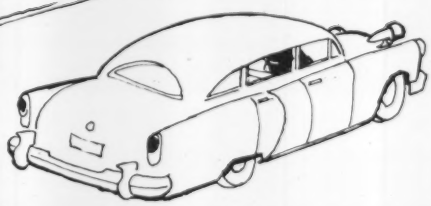

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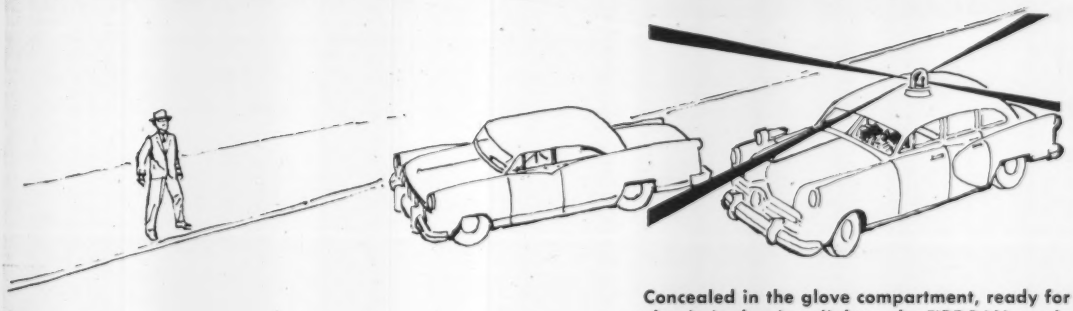

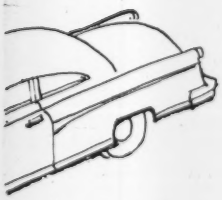

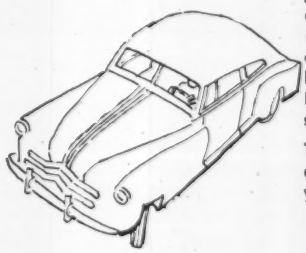

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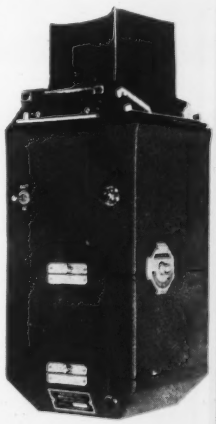

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FROM THE EDITOR. An exchange of ideas, comments, suggestions, and information, designed especially for the reader. See page 66.

Cover Picture

Night police patrol in Central Park, New York City. A foot patrolman calls in the "O.K." from call box located at the end of the cow gate bridge near the reservoir off 86th Street. (Wide World Photos, Photographed by *The New York Times.*)

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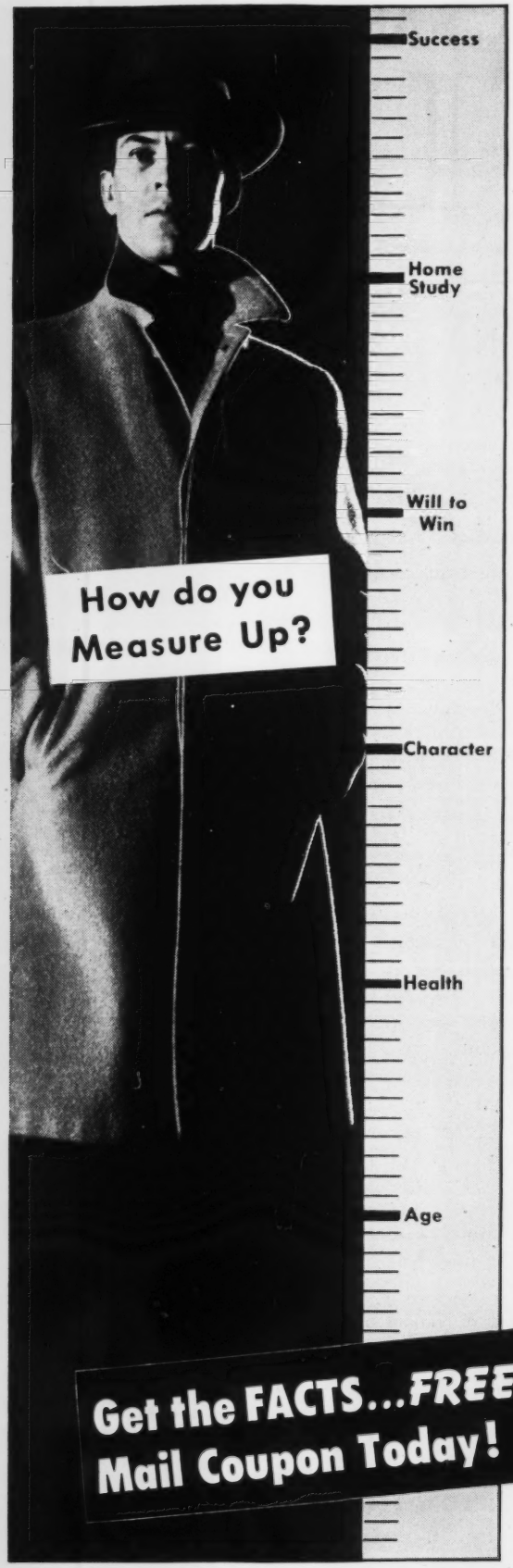

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To the "Pen" with Pencil

By Lieutenant Nicholas J. Kube

EDITOR'S NOTE: *Lieutenant Kube is a veteran of forty-four years with the St. Louis Police Department, starting at the age of fifteen, working seven years as a clerk and telephone operator, with a year and a half out in 1918 to serve in the Navy where he was lightweight boxing champion of the 5th Navy District. In 1919, Lieutenant Kube joined the St. Louis Police Department and shortly thereafter was transferred to the Detective Bureau, where he has progressed through the ranks to his present grade. During this period Lieutenant Kube has served on various squads, including Auto Theft, Bunco and Confidence, and was in charge of the Subversive Squad during World War II. During the past five years Lieutenant Kube has been in charge of the Homicide Squad and the newly developed Technical Arts Division.*

An increasing number of police departments and other law enforcement agencies are making use of artistic talent in their organizations in portrait parlé drawing of the likeness of suspects from descriptions given by witnesses, and in the execution of perspective drawings of crime scenes. In the following article, Lieutenant Kube describes how this procedure is paying dividends in the St. Louis Police Department.

THE old saying, "One picture is worth a thousand words" is receiving a new application in the solving of crime by the St. Louis Police Department. *Portrait parlé* (a sketch or likeness is drawn of a person from a verbal description given by witnesses) and perspective drawings of scenes of crime are now being used with noteworthy success by the St. Louis Police Department.

While just about every modern police technique has been shown to the nation through television, magazine and newspaper feature articles and popular serial cartoons, St. Louisans have scored a beat on most of the country in one phase of police work. For the past several years Mound Citians have watched detectives in the Technical Arts office of the Secret Service Division become an increasingly important aid to prosecuting officials with extraordinary art work in drawings of crime scenes.

The use of this new medium of solving crimes was instituted in the Department by Lieutenant-Colonel James E. Chapman, a progressive young man with twenty-five years of experience as a police officer, and a student of crime detection. Chief Chapman was promoted to Lieutenant-Colonel and made Chief of Detectives on March 18, 1953, when the Honorable Board of Police Commissioners of the City of St. Louis re-organized the Department. Observing the successful use of taking photographs of crime scenes and of having scale plot drawings made by members of the Homicide Squad as an aid to court officials and prosecuting attorneys in the presentation of technical evidence, Chief Chapman quickly realized this technique could be improved with the use of *portrait parlé* and perspective drawing.

Chief Chapman instructed the author to make a survey of the Department personnel to ascertain if there was a man (or men) in the Department capable of being trained to make such drawings. After considering several talented men, we found that Patrolman George Washaw, a beat patrolman in the uniform rank assigned to the Central District, had already gained some reputation among fellow-officers with his talent for drawing. Washaw, as a school boy, displayed his artistic ability by winning a Clean-Up Poster Campaign Contest in a city-wide competition. The prize was a scholarship in art at Washington University, where Washaw completed the course with honor.

Officer Washaw comes from a family of police officers—his father, uncles and grandparents had been members of the St. Louis Police Department. This created a childhood desire in him to follow in their footsteps. Washaw joined the Police Force, not realizing that his talent for art, instead of being wasted, would prove invaluable to him and to the Department. Upon the recommendation of the author, Chief Chapman transferred Patrolman Washaw to the Secret Service Division and promoted him to Corporal.

Chief Chapman also noted the work of Detective Corporal George Hawthorne, a member of the Homicide Squad, who was fulfilling the need for plot drawings requested by prosecuting authorities for the presentation of evidence in criminal trials. At Departmental expense, Corporal Hawthorne was sent to St. Louis University for a course in Technical Drawing, from which school he received a Certificate of Accomplishment. Also at Departmental expense, Corporal Hawthorne is presently taking a correspondence course in Elementary Architectural and Perspective Drawing.

With Corporal Hawthorne and Corporal Washaw available as a nucleus, Chief Chapman suggested to the Honorable Board of Police Com-

Address: Lieutenant Nicholas J. Kube, Homicide Squad, Detective Division, St. Louis Police Department, St. Louis, Missouri.

missioners that a new unit be formed to be known as the Technical Arts Division of the Homicide Squad. With the approval of the Board, necessary equipment was purchased and two well-lighted rooms were assigned to the unit. This unit acts in the capacity of a liaison team between the uniformed ranks, the laboratory technicians, the coroner's office, and the prosecuting officials. When evidence warrants, the Technical Arts Division is called upon to prepare scale plots, cut-out and perspective drawings of a crime scene. This supplements the work of the Homicide Squad which operates a Technical Crew twenty-four hours a day on eight-hour shifts. Each crew is equipped with Speed-Graphic camera, measuring instruments, and other necessary equipment for taking of pictures and measurements, as well as the collection of physical evidence at the scene of the crime.

IN a step to guard against loss or mutilation of the expertly prepared drawings, should the case in which they were used be appealed, the Technical Arts office recently innovated the use of color photographing of their work.

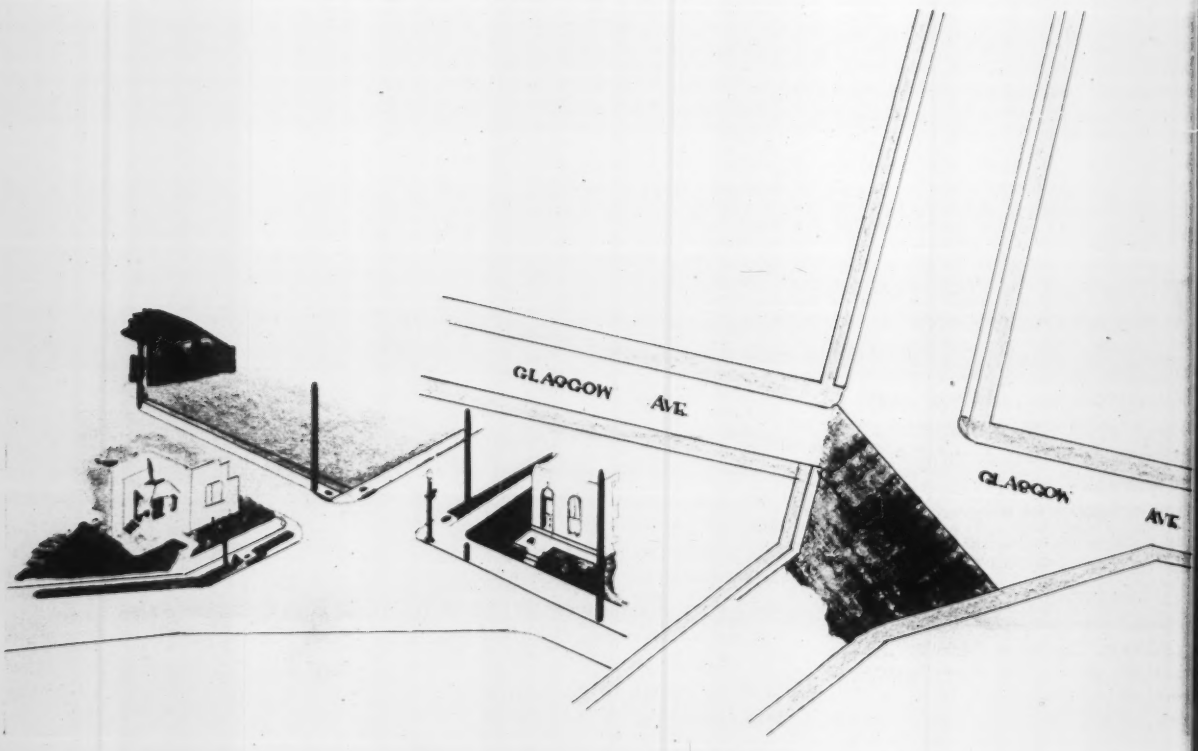
Drawings on 40″ x 60″ illustration boards done either in perspective or isometric, half color and in cutaway and half in black and white drawn accurately to scale give the jurors a large clear picture and enhances photographs taken at a crime scene. But, such a large drawing would be too cumbersome to send to the appellate courts. Now, a small color slide which can be magnified to actual size or larger on a screen enables the court members to study the same convincing drawings which were used in the original trial.

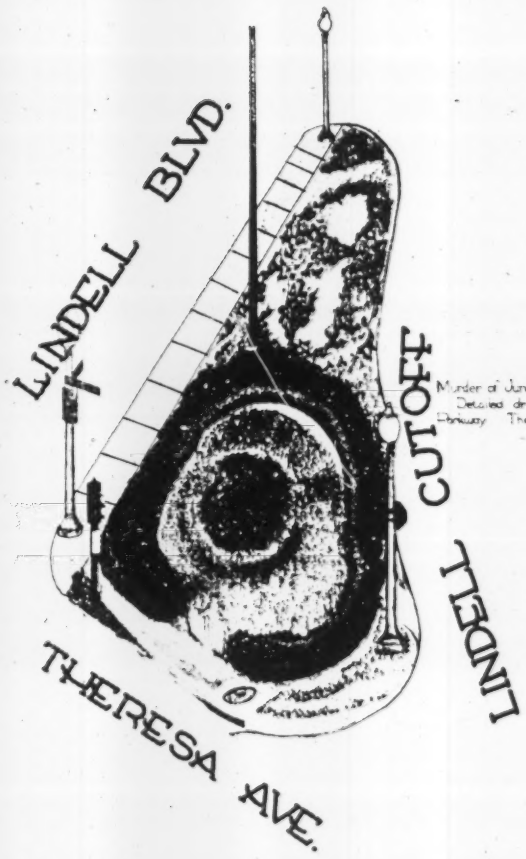
Portrait parlé soon became Corporal George Washaw's specialty. When a victim or victims (or witnesses) of major crimes view pictures of suspects at Police Headquarters and are unable to find the suspect's photograph in the Identification Bureau, they are then escorted to the Technical Arts Division of the Homicide Squad. Under trained questioning, victim or witnesses are requested to give description of suspect—facial features such as nose, mouth, ears, chin, hair style, etc.

PROCEDURE FOR INTERROGATION

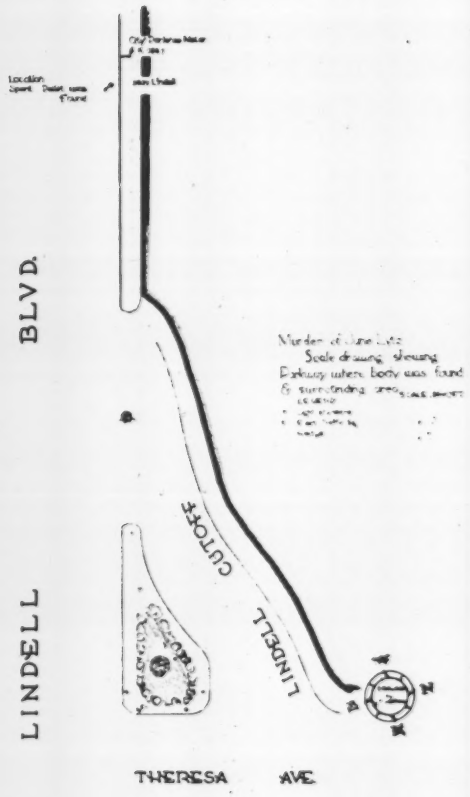
The procedure of interrogation of witnesses for a *portrait parlé* drawing is an important step to a drawing that will bring results. It should be impressed upon the person or persons giving the description that a bad likeness will do more harm than no drawing at all. It is important to have the witness at ease, and to let him (or her) know that in reality they are making the drawing, and that actually you are doing nothing more than holding the pencil. It is also important that you evaluate your witness as to his possible accuracy and the conditions under which he viewed the subject. For instance, it would be an impossibility to give a good facial description of anyone, if viewed from a distance of more than fifty feet. Also, conditions of weather, lighting, and emotional strain of the witness at the time of viewing the subject, plays an

FIGS. 1-3. An illustration in perspective gives the members of the Court, including the jurors, a clear convincing picture of the crime locale.
(Figures below and at right)

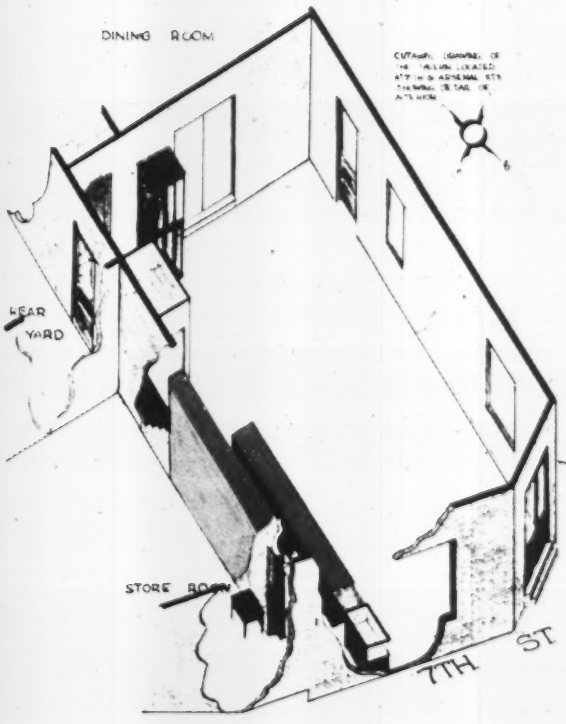


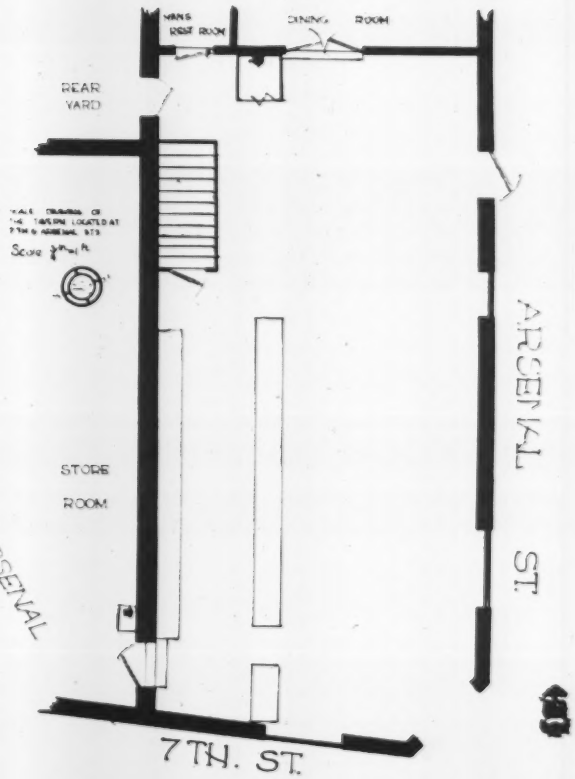


Murder of June Lytz
Detailed drawing of
Driveway. The scene of murder



Murder of June Lytz
Scale drawing showing
Driveway where body was found
& surrounding area





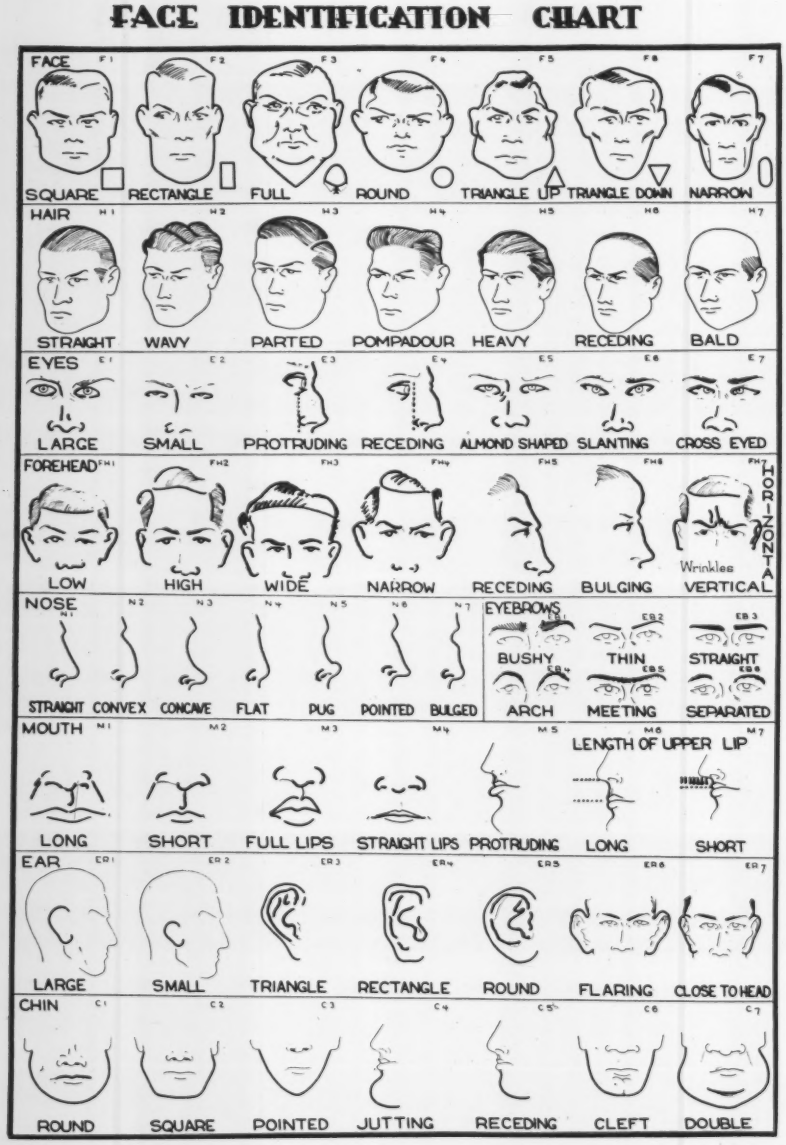


FIG. 4. A face chart, similar to those prepared by the Federal Bureau of Investigation, or a face structure book such as those used by many art schools aids the witness in identifying the type of face possessed by the suspect.

important role in the accuracy of the finished drawing. When you are satisfied that the witness is dependable and can give a good description, you are ready to start your drawing.

It is beneficial to inform the witness that almost every person has some facial likeness that would type the suspect in a category of some prominent person or some person known to him. Also, a face chart, such as the "Face Identification Chart" prepared by the F.B.I., or a face structure book (the type that is used by many art schools), or the use of photos of different associates who have the seven basic shapes of heads—No. 1 Square, No. 2 Rectangle, No. 3 Full, No. 4 Round, No. 5 Triangle-up, No. 6 Triangle-down, No. 7 Narrow—are a great aid to the witness in pointing out the type face of the suspect. Corporal Washaw has drawn a face identification chart similar to the F.B.I. chart, with modifications, showing head shape, hair type, eyes, forehead, eyebrows, nose, mouth and lips, ears and chin. This chart is placed in a prominent spot above the drawing board where it can be viewed by the witness and the artist. It is well to have the witness sit beside the artist and instruct him (the artist) that what he is drawing does or does not meet with the conception of the witness.

DRAWING PROCEDURE

The steps taken to make a drawing from the description of a witness are as follows:

The witness and artist work as a team. It is recommended that a soft lead pencil be used along with a good grade of drawing paper that will stand many erasures. In making the drawing, it will be noted that a witness cannot judge whether or not the drawing is beginning to take form unless all the features in the face are represented—that is, if just the eyes are drawn in the face, the average witness cannot tell whether or not they are the type of eyes of the wanted subject; whereas if a mouth and nose are drawn in, even though they are represented by nothing more than a thin line, it will give the witness a clearer vision of the face. In making the drawing, it is better not to dwell too long on any one feature of the face, because the witness will become impatient and restless and unconsciously lose the mental picture of the suspect. It is well to suggest to the witness to take a short recess from time to time. By serving a cup of coffee and having an easy chair available for the witness during these rest periods, he will be refreshed, more relaxed, and will return to the drawing board with renewed vigor.

After a preliminary sketch has been completed to the satisfaction of the witness, the highlights are brought out by the artist (through shading) to reach a completed stage.

IN case there is more than one witness, it is advisable at first to interview all witnesses together. They should then be separated and a separate drawing should be made from

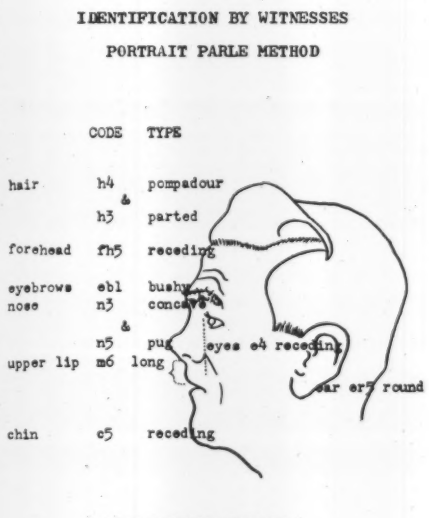


FIG. 5. (above) A preliminary sketch is first made based upon the verbal descriptions given by witnesses and then the completed drawing is executed.

the description as given by each witness. When the drawings, as given by each witness, have been completed, they are then shown to all witnesses so that they may agree on the most accurate likeness of the wanted person. Then a final or master drawing is made, subject to the approval of all witnesses.

ACCOMPLISHMENT

An exemplary accomplishment of Corporal George Washaw is a drawing of Henry Moore, a Negro. Early in the morning of July 18, 1955, a young mother was asleep in her apartment. The weather was hot, with the thermometer reading over 90°, so she left the main door to her apartment ajar, but she had latched a lattice door with a common hook latch. At about 2:30 A.M., she was awakened by a parakeet making unusual sounds or noises. She arose from her bed to look in on her nine-month old child. She was grabbed by an intruder and during the scuffle the prowler stabbed her in the abdomen and then fled from the apartment. She died several hours later. Her only statement was "A Negro stabbed me." The intruder had unlatched the door and was ransacking the house when interrupted by the young woman. Her screams aroused neighbors. The culprit in flight rushed down the stairway in the rear of the apartment. Upon reaching the alley, he stopped under a light. This gave a clear view of the suspect's face to a witness, who was in a darkened room in her apartment. During the interview at the Technical Arts Division, she gave an accurate description of the features of the man she had observed fleeing from the apartment.

Detective Corporal George Washaw made a drawing of his conception from her verbal description. Upon seeing the finished picture, Miss —— said it was an identical image of the suspect and that she would know him anywhere. Copies of the drawing were distributed to members of the Police Department. When the picture was seen by Detective Sergeant Frank Eresh and Detective Corporal Benjamin Massey, they immediately recognized it as a likeness of Henry Moore.

FIG. 6. (below) This drawing led to the immediate identification of the killer by detectives and the solution of a baffling murder case.

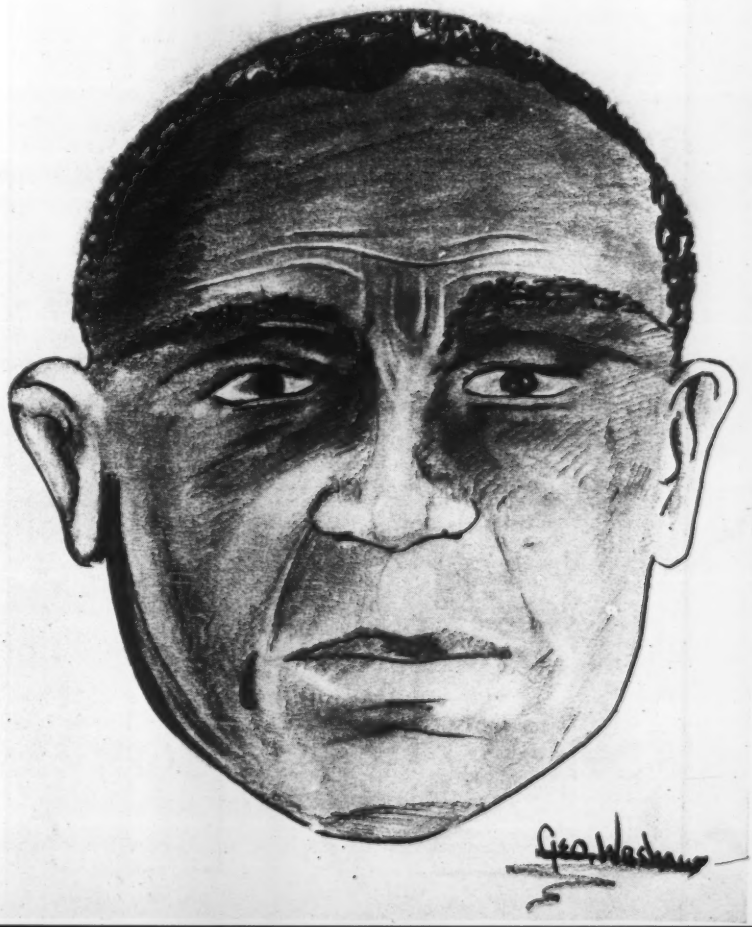
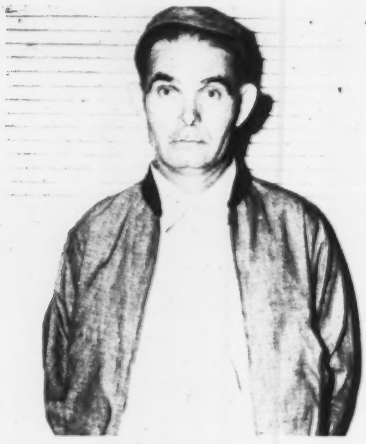


FIG. 7. (above) Artist's conception of suspect wanted in a robbery case, based upon verbal descriptions of witnesses.

Between the 13th and 18th of September 1955, five service stations in St. Louis were held up and robbed. Then no more cases of this modus operandi were reported indicating that this was the hit and run type of hold-up man. Using witnesses and victims in the cases, a *portrait parlé* drawing was made by Det. Corp. George Washaw of our Technical Arts Division, and upon completion of same all witnesses agreed to the striking likeness of the culprit responsible.



On March 1, 1956, one Thomas Jasper Hayes was apprehended by the Kansas City, Kansas authorities and admitted being responsible for these St. Louis robberies. A photo of Hayes was forwarded to this department and all victims in these cases positively identified said photograph.

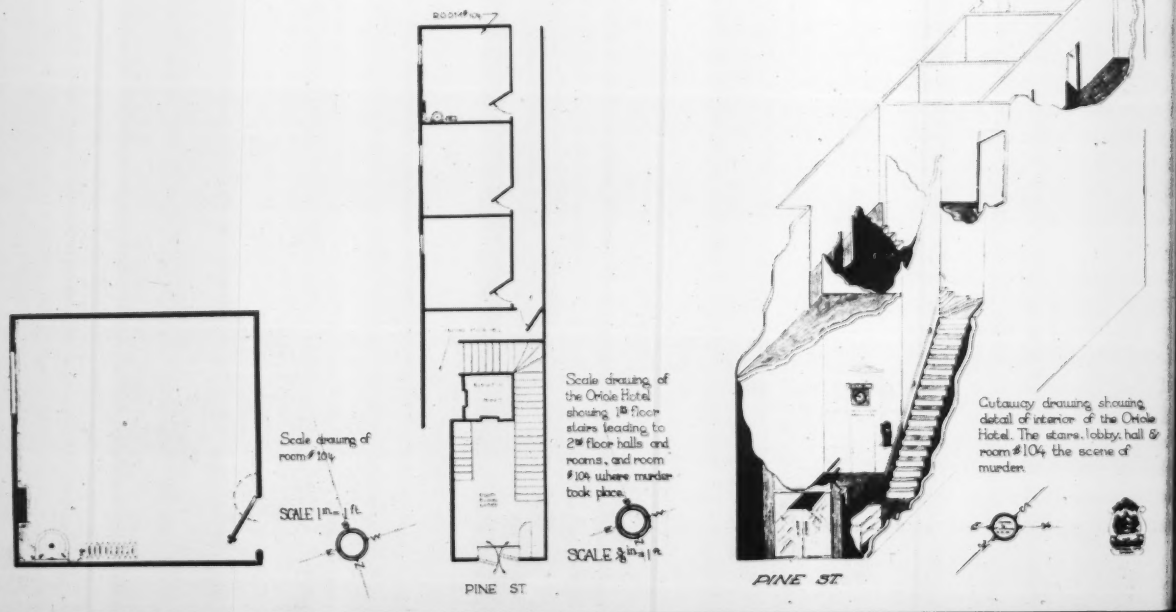
Note the similarity of *portrait parlé* and the photo taken of Thomas Hayes.

INVESTIGATION disclosed that Henry Moore had left his place of employment two days after the murder had been committed, taking with him $190 of his employer's money. After several months of exhaustive search, Moore was apprehended. He made a statement admitting the murder and re-enacted the crime. Upon being brought to trial, he pleaded guilty and was sentenced to life imprisonment in the Missouri State Penitentiary, where he is presently confined.

A local newspaper announced in a feature story that the police had used a NEW weapon in the form of Portrait Parle in the solution of the crime. Henry Moore himself, after confessing, added the statement that in his life of crime he had become familiar with the use of firearms and clubs in the hands of police officers, as well as the necessity of identifying witnesses, but had never reckoned with (as he termed it) "the use of a poison pencil" in the hand of a talented police officer.

Numerous other cases wherein *portrait parlé* drawings, as well as perspective and scale drawings, were used, have greatly assisted the Department in identifying suspects and aiding prosecuting officials, jurors, and defense attorneys—all of whom have highly praised the work of the Technical Arts Unit of the Homicide Squad. *Portrait parlé* drawings issued in daily bulletins have been of great assistance to the Department in learning the identity of suspects. Criminals are learning what it means to go "To the 'Pen' by Pencil."

FIG. 8. (below) Drawings executed to scale in perspective effectively supplement photographs taken at the crime scene.


Scale drawing of room #104
SCALE 1" = 1 ft.
PINE ST
Scale drawing of the Oriole Hotel showing 1st floor stairs leading to 2nd floor halls and rooms, and room #104 where murder took place.
SCALE 1/8" = 1 ft.
PINE ST
Cutaway drawing showing detail of interior of the Oriole Hotel. The stairs, lobby, hall & room #104 the scene of murder.

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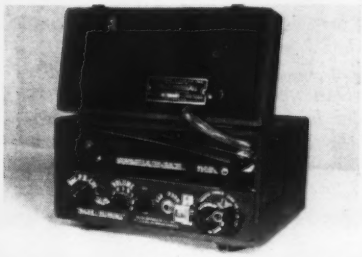

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The Police and Human Relations

By Lieutenant George P. McManus

EDITOR'S NOTE: *Lieutenant McManus has been with the New York City Police Department over a period of thirteen years, the past five years of which he has been assigned to the staff of the Police Academy. His responsibilities have included the preparation and presentation of the Department's Human Relations training program. He was the recipient of the Human Relations Award by the Mayor's Committee on unity.*

He has lectured at various police seminars and institutes on this subject, including the Southern Police Institute and the Delaware State Police In-Service Training School. In addition to his police training activities, he has been a contributor to the journals. Lieutenant McManus is currently assigned as Supervisor of In-Service Training Schools of the New York Police Academy which includes the Associate in Applied Science program and the graduate training offered jointly by the Police Academy and the City College of New York.

THE student of public administration will have little difficulty I think, in substantiating the observation that over the past fifteen years the police, perhaps more so than any other public agency, have made remarkable progress toward the professionalization of the service. He need only point out the development of infinitely better training programs, the expanding acceptance and use of modern equipment, the growing number of Departments of Police Administration in American colleges, and the increasing willingness, indeed the enthusiasm, to exchange information and the results of research, to prove his point. We have come a long way along the road of historical development from that point at which we were accepted as somewhat of a necessary evil, demanding little and giving little in return. We are fast approaching that point at which the public will accept us for what we are—a professional body of men and women operating by democratic means within the framework of a free society, and dedicated both to the security of the nation and to the preservation of the rights of every individual.

NONE of this has come about by chance; progress never does. Intelligent police administrators had first to recognize the deplorable status of law enforcement, and then to make plans for its revitalization. Much soul-searching was called for; courageous and constructive self-criticism was required; a patient and dispassionate evaluation of the predominant attitude of the public was needed; and finally some dynamic decisions had to be reached. It is to the everlasting credit of our administrators, some of whom were themselves the products (or the victims) of the lethargic thinking of the past, that these things were accomplished and these decisions reached. Radical departures from the past are not easily made. There was the challenge to steadfastness in the face of criticism from within, and determination in the face of pressure from without the departments. These administrators were equal to the task.

But how radical was the departure from the past? Perhaps the best evidence that there has been a "clean break" from the smug, self-satisfied attitude, is the manifest willingness of the police to tear down the "wall of separation" between us and the public we serve. We have come to recognize that a peaceful and free community is the business of everyone in that community, and that a police agency unresponsive to the opinion of the public and disinterested in the vast community resources available to assist in the improvement of law enforcement, is not consonant with the democratic concept of policing.

HUMAN RELATIONS IMPROVED

ESPECIALLY in the area of human relations have we sought to take an account of our activities and attitudes. We have been willing to stand apart and observe ourselves objectively; we were ready to admit we were wrong in some of our attitudes and traditional practices; we met with community relations people and we sought their frank criticism—and assistance; we concluded that a re-definition of the role of the police officer in a democratic society was needed, and we determined to effect the means necessary to make that role a reality in the thinking of our men and women. These we conceive to be radical departures.

We have not accepted the blame for the human relations problems that bedevil our nation, nor do we propose to solve all of these problems; but we have discovered the uniqueness of our position in terms of these problems, and we have recognized the implications of our daily performance of duty insofar as the peace not only of our communities, but of the *world*, is concerned.

A casual look at the world in almost any period of history will disclose a tragic spectacle of poor human relations. There have always been wars and rumors of wars, wanton destruction of life and property, bitterness and hatred, suspicion and fear between people. Man has never been at a loss for something to fight over—property, power, lust, religion, offended honor. He has wasted his God-given talents in his mighty effort to prove himself superior to his

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fellow men. Lying and cheating and bullying is an old game among the nations of the world. But perhaps never before has there been such fanatical hatred as is evident today in the bitter conflicts which are taking place all over the earth. The enemies of our own nation and of the free world have labored tirelessly to divide the peoples of the world along class and racial lines, and to fan the flames of racial and class hatred. Particularly strenuous have been their efforts to hold our nation up before the eyes of the world as the exploiters of the underprivileged and the enemy of the so-called colored races.

Within our borders too, the enemy works ceaselessly to divide and destroy our country. He mocks our religious and political institutions; he "finds" prejudice and discrimination where it doesn't exist, and where it does exist, he exaggerates it and capitalizes on it. Wherever there is labor unrest, he will do his level best to block a solution. His favorite field is in the large cities where so many people of different cultural and national backgrounds live and work together; where tension exists and opportunities for transforming minor incidents into major clashes abound; where seeds of hatred based upon fear and suspicion and ignorance can be so readily sown. He works both sides of the street in race riots urging one group against the other and spurring the other to retaliation.

As the Communist and other subversive seek to destroy our national institutions, so does he begin invariably by striving to undermine our police organizations. We are his primary target. His tactic is to destroy the public confidence in and respect for its police, and to substitute fear and hatred. He is constantly alert to seize upon any incident which will serve his purpose, and if necessary, he will twist and distort the facts to further his cause. We are aware that we must be equally alert to deprive him of ammunition to be used against us; we are determined to retain the confidence, respect and cooperation of the public in the fulfillment of our trust as police officers.

The past war has made of almost every large urban community, a highly heterogeneous society. Not only do these people come from all parts of the world, but they are continually in communication with the places from which they come, and the story of what happens to them in our communities is known throughout the world. Thus in addition to representing law and order in his own immediate jurisdiction, the American policeman who deals with persons of a cultural background different from his own, represents the United States before the world in a very real sense. The emphasis on human relations training in the police curriculum is therefore a most practical consideration. It is not to be thought of as an outgrowth of egg-headed idealism, nor a deferring to the insistent demands of minority pressure groups; it is simply good policing. In most instances, the

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majority of the police force in the average community is very sensitive to our responsibility to the individual and to the nation. At the point, however, at which it is not understood that these implications are nationally and internationally significant, our difficulties arise. The behavior of one thoughtless policeman on some American side-street, can and does become headline news behind the iron or bamboo curtain.

DANGER SIGNS IN THE COMMUNITY

We have been able to identify the danger signs in the community too. Our experience has taught us that the surest indications of rising tension are: (1) widespread belief in rumor, and (2) interference with the police in the execution of their responsibilities. Today, no community can meet its responsibilities unless all of its citizens feel they are a part of the community. The yardstick (as minority groups conceive it) which will measure the degree to which they are welcome in a community, is the treatment they receive at the hands of the police. Generally, it is felt, that what is tolerated in police treatment is what the community itself wants, and what is politically sanctioned. Our behavior is to minority groups, a mirror reflecting the temper of the whole community. Our service is most taken for granted when it is good, and most abused when it is questionable. While it tries the patience of the policeman to have his errors so magnified and held up to public ridicule, it is nevertheless understandable and desirable that the enforcement arm of government should meet such scrutiny. To say that the police officer is "the law," is to point up at once both the function and the inherent danger in policing.

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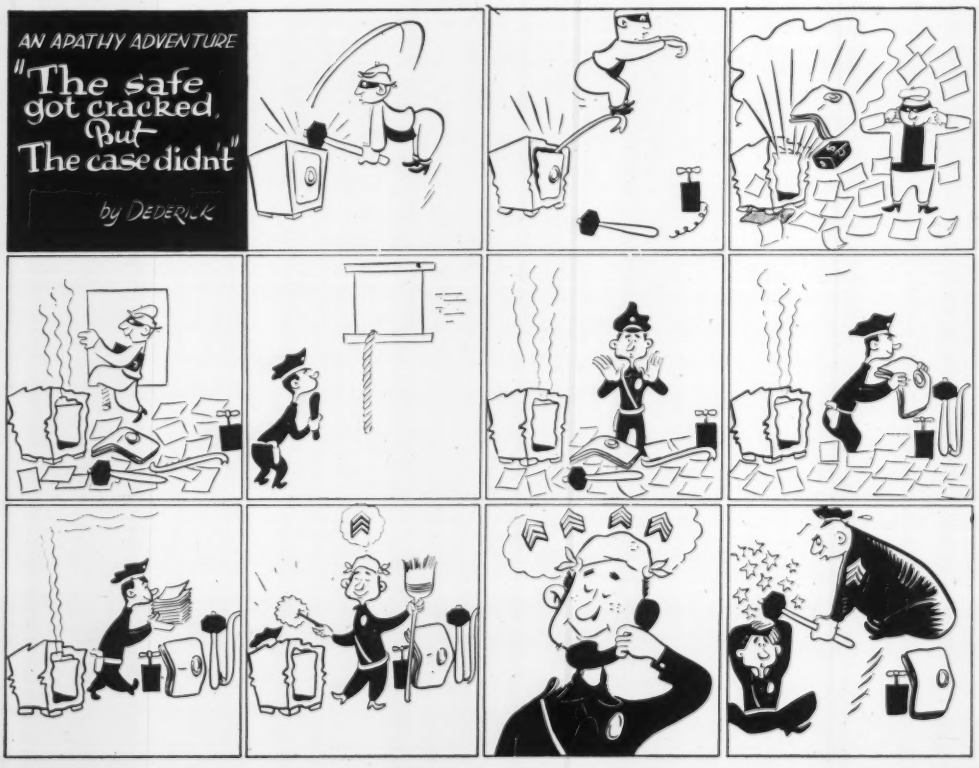


From: *Daily Training Bulletin of the Los Angeles Police Department*, courtesy, W. H. Parker, Chief.

on his beat is often the only relationship he has with his government. Certainly he is the most immediate contact. In addition to upholding the majesty of our law and enforcing the rules of conduct we have made for our society to function, the policeman is the symbol of fairness and justice which most Americans consider basic. Not that the individual citizen is always fair and just in his attitude toward police. He is often too quick to identify all policemen in his community (or even in another community) with the injustice or arrogance he has suffered at the hands of one specific officer. But if professors can endure with patience the appellation "absent-minded," and politicians can smile charitably at the stereotyped caricature of the "windy shouter of empty promises," we can I think, await hopefully the day when the educational process will help people to dissociate in their thinking the sinful few from the noble many.

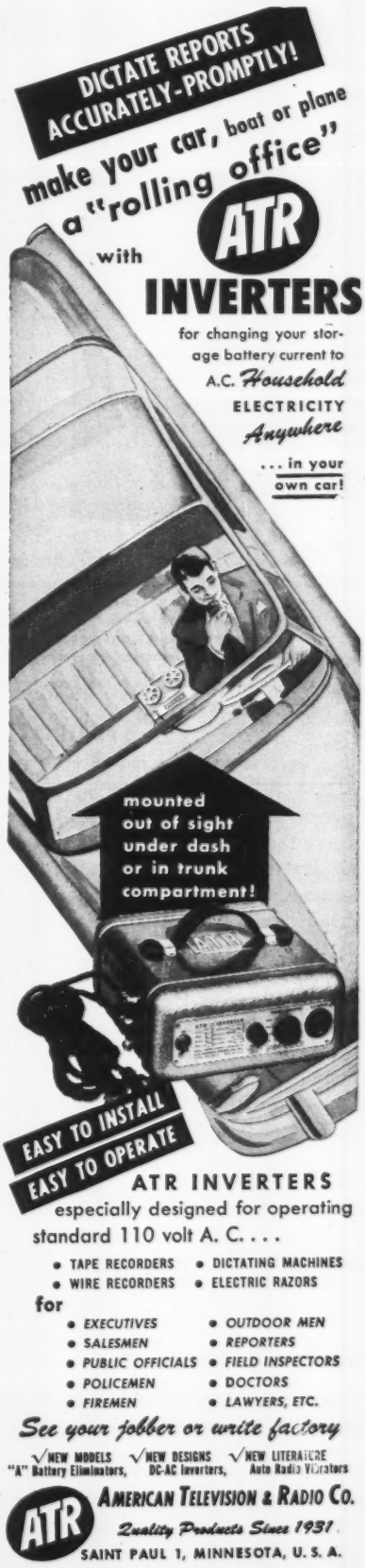
We have then taken note of the uniqueness of our position in the matter of human relations. We have examined our own short-comings and we have studied the vicissitudes of the public attitude. We have decided that for our part, a continuous training and retraining in acceptable behavior based upon the Constitutional principle of "due process" and equality before the law, as well as the Judaeo-Christian concepts of Brotherhood and Charity, will tend toward the solution. The education of the public, and more specifically minority groups, with a view to developing their understanding of police problems and limitations and winning their confidence and cooperation in the business of law enforcement, we conceive as the function of responsible community leaders. By working with and through precinct councils and other civic bodies, we would hope ultimately to bring about a harmony of purpose and a sharing of the burden of policing between the interested parties—the police *and* the community.

RELATIONSHIPS BETWEEN POLICEMEN

NOR have we forgotten that other area wherein police human relations are so important—relationships between policemen themselves. One of the distinguishing marks of good police administration is the amount of opportunity for and encouragement of growth of the police personnel. The fostering of such growth occurs in two ways. The first is that which takes place from day to day through the medium of supervision by superior officers. The second is through in-service training courses.

The first aspect of such training is perhaps the more important, for it involves the interpretation and reinterpretation of what is good as well as what is poor policing for the young men and women who are pursuing the career. The measure of the effectiveness of the supervisor, regardless of rank, is the degree to which he stimulates growth and development in those who work under him. From the human relations point of view, morale cannot be maintained in any group unless there is the feeling of personal development—aside from promotions and salary increases—within the individual and the group.

No system of discipline which depends upon fear as a means of control can ever produce the kind of morale that lifts a task as important and as sensitive as policing to the dignity it deserves to enjoy. The sole reliance upon negative discipline will stultify the personality and proper development of the subordinate. Our training programs for superior officers reflect our belief in the principle that the Art of Supervision is not an asset which everyone possesses. We seek constantly to improve upon it by training and continuous study, acquiring a knowledge of people and an ability to relate oneself to them. The modern superior officer must develop the technique of being able to criticize and suggest improvement without destroying the other's self-respect. He must too, be a mature and stable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personality who is willing to face up to the unfortunate aspect of public service which demands, in consonance with public opinion, that heads roll when something goes wrong. His decisions, when they are based upon correct thnking, must be fearlessly made. He must be willing to stand on them and to support those of his subordinates who are acting upon them, irrespective of any internal or external pressures. Where he is acting within the framework of justice and impartiality, he need fear no criticism from self-serving individuals or groups. His reputation as a fair-minded and professional police officer will be more than an adequate defense. In this connection, while all complaints from the citizenry should be accepted and thoroughly investigated, proper safeguards against vicious and unwarranted complaints must be provided for. Too often prudence and a willingness to understand are misinterpreted for fear and indecision. Such misapprehension may lead to the patently erroneous conclusion that regulations can be ignored or even that police can be interfered with or abused, with impunity. This of course is the other side of the coin. Such a condition would be as intolerable as the existence of a tyrannical police force completely insensitive to the rights and liberties of the people. The Common ground of understanding will be arrived at but it will take patience and the professional attitude on the part of police, and untiring and dedicated effort on the part of civic and minority group leaders to reach it. There is every reason to believe that the goal is in sight. A refreshing atmosphere in which teamwork and joint effort between police administrators and community relations leaders gives promise of the fulfillment of the wish.

The attempt here has not been to define specific areas of conflict in the police human relations field, nor to speculate upon possible detailed solutions. Rather the intent was to outline broadly the recent manifestations of a "coming-of-age" on the parts of both the police and the community, and to present the evidence that modern police administrators have so adjusted their thinking and their training curricula, that the subject of human relations in police work has taken its rightful primary position. The road is half-traveled, but there can be no slackening of the pace. The threat of complacency and self-satisfaction must be averted if we are to hold the gains we have made and attain to the final destination where in an atmosphere of mutual interest, respect and confidence the public-police team will be able adequately to cope with the law enforcement problems of our time. This atmosphere must pervade. Our way of life depends upon the whole community's ability to prevent inter-group and inter-personal conflict, or, being unable to prevent them, to control them so that harmony will predominate and the sometimes trying burden of living and working together will be a more bearable one.

The Role of Photography in the Coroner's Office*

By S. R. GERBER, M.D., Coroner; LESTER ADELSON, M.D., LAWRENCE JOHNSON, Photographer

THE tasks confronting medicolegal investigating agencies are as varied and intricate as twentieth-century civilization itself. They include evaluation of the many factors involved in the huge number of traffic fatalities that occur annually in metropolitan jurisdictions, analysis of industrial hazards that nowadays require the full-time attention of safety engineers, and the investigation of a very great many chemical and immunologic problems. These are in addition, of course, to the homicides, suicides, accidental deaths, and deaths from other causes that were familiar also to the coroner of a century ago.

Whenever the apparent cause of death or the circumstances involved indicate that a fatality may have resulted from the negligent or deliberate act of either the victim or another person, inquiry into the details must be made by a competent medical public official. The same is true of sudden and unexpected natural deaths and of any deaths possibly due to some unrecognized threat to public health. The eradication of threats to health and life frequently depends on the precise pinpointing of the circumstances involved in an obscure death through the efforts of the coroner and his staff.

The purpose of these medicolegal inquiries is to establish the exact cause and manner of death. For this reason, the acquisition and documentation of accurate and unbiased evidence are essential if justice is to be assisted in criminal and civil proceedings. In the study and presentation of this evidence, the present-day coroner utilizes information and technics obtained from a wide range of intellectual disciplines: pathology, chemistry, toxicology, radiology, anthropology, dentistry, entomology, botany, and many others. The use of a considerable variety of precision instruments is required, including microscopes of many kinds, x-ray diffraction cameras, infrared and ultraviolet spectrophotometers, measuring apparatus of all types, and radiographic and photographic equipment. This article shows how photography materially aids the coroner in discharging his responsibilities.

THE NEED FOR PHOTOGRAPHY IN THE CORONER'S PROGRAM

THE photographic camera, loaded with color film, is among the most commonly used and valuable pieces of equipment in the coroner's office. Since the coroner deals with highly perishable material, he must be in a position to record permanently and accurately the appearance of a body or organs at the time of examination. Actually, the photographic record supplements and complements, but does not supplant, the complete verbal description. Rarely, however, will the words of the individual who describes the signs of injury or disease be as graphic or compelling as a well-made color photograph of the subject.

Anatomic pictures, however, represent but a fraction of the use of photography in medicolegal work. Photographs of ancillary evidence, such as bullets or clothing, in or on a body, or of other material having some bearing on the cause and manner of death, also assist in documenting an inquiry.

The value of photographs, moreover, goes far beyond their use in cases under investigation. Such photographs, together with other data and material accumulated at the coroner's office, can be of benefit to many professional groups and individuals: medical students and practicing physicians; law students and practicing attorneys; coroners and medical examiners; police academy trainees; police investigators and law enforcement officials; postgraduate students in law, medicine, and police science; insurance claims adjusters; newspaper reporters; and agencies for public health and public safety. The importance of such visual aids in the medicolegal indoctrination and training of these various groups cannot be stressed too strongly.

The presentation of the work of the coroner's office to interested lay groups and service organizations is another function immeasurably aided by well-documented cases illustrated with color transparencies. Such public relations and educational activities are important to the coroner's program, because they enlighten the community and make it possible for him to obtain necessary public cooperation. Inasmuch as death may strike suddenly, unexpectedly, or violently anywhere, it is essential that the entire community be aware of the coroner's duties, responsibilities, and authority. In this way, people will not be confused or apprehensive when the death of a friend or relative is investigated. Unfortunately, there is a widespread misconception that when the coroner takes jurisdiction over a body there is necessarily something illegal or

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Address: S. R. Gerber, M.D., Coroner's Office, County of Cuyahoga, 2121 Adelbert Rd., Cleveland, Ohio.

suspicious connected with the death and that a stigma is attached to any death considered by the coroner's office. Experience in Cleveland has shown that more than 60 per cent of all the deaths certified by the coroner are the result of natural causes, 24 per cent are accidental, 8 per cent suicidal, 4 per cent homicidal, and the remainder due to violence of undetermined origin.

Research into the causes and manifestations of sudden and unexpected natural and violent death also is an invaluable by-product of the daily work of the modern medicolegal office. Gross-specimen photography and photomicrography are integral parts in the presentation or publication of the results of such studies.

ILLUSTRATED EXAMPLES OF THE MEDICOLEGAL WORK OF THE CORONER'S OFFICE

THE post-mortem medicolegal investigation seeks to elicit from the body answers to five basic questions:

1. Who is this person? . . . the problem of identification.

2. When did this person die? . . . the establishment of the time of death or the range of time within which death may have occurred.

3. Did this person die of natural or violent causes? . . . the determination of the manner of death.

4. If this person died by violence, was it accident, suicide, or homicide? . . . the questions of culpability and negligence that must be answered.

5. If this person was murdered, who did it? . . . the search for evidence, on and within the body, that will aid in the apprehension of those responsible for the death.

FIGURE 1

Identification

For humanitarian, civil, and criminologic motives, establishing the identity of an unknown body is a frequent and fundamental problem in post-mortem medicolegal work. The family and friends of the deceased must be informed of the death so that the body may be claimed and properly interred in accordance with the deceased's religion. Payment of insurance death benefits, settlement of estates, probate of wills, and remarriage of surviving spouse depend upon establishing the identity of the body.

Besides the uses previously mentioned, photographs are valuable as portable records of evidence. Obviously, the actual persons or objects cannot always be available for purposes of identification or other reasons during an investigation.

Case—A severely burned body was discovered in a burned-out bowling alley after the fire had been extinguished. The facial features, extremities, and clothing were so badly damaged as to prevent identification by such ordinary procedures as sight recognition, fingerprinting, or the finding of name tapes or laundry marks on the clothing. Within the mouth there was a partially burned artificial upper denture. Embedded within the plastic portion of the denture was a strip of paper with the typewritten letters ". . . ghns" with part of a letter preceding the "g" (Figure 1). The rest of the word had been destroyed. Starting with this information, investigation revealed that the victim's name was "Vaughns."

Time of Death

Establishing the time of death may have a direct bearing on determining the cause and manner of death. Photographic records are of major importance here.

FIGURE 2

FIGURE 3

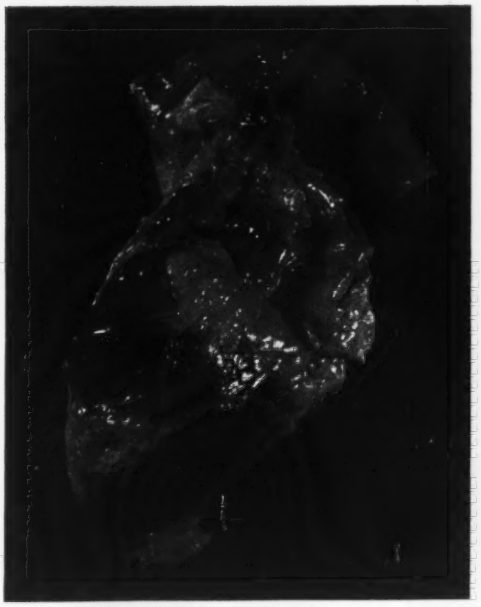

FIGURE 4

Case—A 70-year-old man, known to have had coronary disease, was found dead in a burned room. Autopsy disclosed severe occlusive coronary arteriosclerosis and the presence of smoke particles in the trachea and major bronchi (Figure 2). Analysis of the blood revealed 50 per cent saturation of the hemoglobin with carbon monoxide. The smoke in the air passages and the presence of large quantities of carboxyhemoglobin were proof that respiration had taken place in the fire, and that death was the result of the fire. Had death occurred from the pre-existing disease, neither of these findings would have been present. An insurance claim with double indemnity benefits for accidental death was paid.

FIGURE 5

Manner of Death

Ample experience has taught that death from natural causes may masquerade as suicide, accident, or homicide, and vice versa. In some deaths from natural causes, there may be abundant external injury with no significant internal trauma. On the other hand, fatal violence may be sustained with little or no external evidence to point to unnatural death. In the former situation, an innocent person may find himself under suspicion of homicide. In the latter instance, a murder may go unsuspected and undetected, or beneficiaries may be deprived of insurance benefits for accidental death or industrial injury. Death by poisoning is the unnatural fatality that most frequently presents no external evidence of what has transpired. In the interest of public welfare and the administration of justice, it is vital that the exact manner of death be established in all such doubtful cases. Photography is particularly valuable in documenting the appearance of a body before transient or irreplaceable evidence is destroyed during the investigation.

Case—A 60-year-old moribund man was admitted to the hospital with clinical evidence of cerebral damage and multiple bruises over the body. Death occurred before diagnostic studies could be completed. Relatives stated that the deceased had engaged in an altercation two days previously and had been knocked down. The police promptly arrested the other person involved in the fight. Autopsy showed subacute bacterial endocarditis and a ruptured mycotic cerebral aneurysm (Figure 3). There was no evidence of mechanical trauma to the skull or brain. The suspect was released.

Case—The police brought to the coroner's office the body of a 26-year-old woman. They stated that they had been notified of the death by her friends who had claimed that she had been ill for a long period of time, and that her physician was on vacation and thus not available to sign the death certificate. The police had found the body neatly arranged in bed in an apparently well-kept home that showed no signs of disturbance. At autopsy slight abrasions on the nose and breast were revealed. Internally there was a laceration of the left cardiac ventricle with hemopericardium, and lacerations of the liver with hemoperitoneum (Figure 4). The true nature of the death was immediately communicated to the police. Reinterrogation disclosed that

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the victim's paramour had killed her by jumping on her chest and abdomen with his knees. He had done this in the presence of onlookers and had threatened them with a similar fate if they gave any information to the authorities. They in turn attempted to pass off the death as one due to natural causes. The suspect was indicted and pleaded guilty to manslaughter.

Case—A 26-year-old man, registered from an out-of-town address, was found dead in bed in a hotel room. Autopsy disclosed no evidence of natural disease or injury, but chemical analysis of the blood and viscera revealed lethal quantities of barbiturate. Search of the personal belongings of the victim disclosed literally hundreds of barbiturate pills secreted in a portable radio (Figure 5). Police investigation showed the deceased was a "barbiturate bootlegger." Death was the result of overindulgence in his own illicit merchandise.

Suicide, Homicide, or Accident

Where death is the result of either known or unknown violence, it is essential to determine the manner in which the injuries were sustained. Especially, when there were no eye witnesses, or when witnesses tell contradictory stories, examination of the body and clothing, combined with the results of other avenues of inquiry, may well furnish the evidence for a correct reconstruction of what has transpired. Here also photography may play a major role in recording accurately the appearance of details that lead to a solution.

Case—A 42-year-old man was found dead with a shotgun wound of the lower part of his chest. The weapon was found a few yards from the body. Autopsy disclosed a contact type of entrance wound and extrusion of omentum through the perforation in the skin (Figure 6, left). The full charge of the shotgun, including the wadding, was found within the body. Examination of the pajamas worn at the time of the shooting showed blackening and burning of the fabric consistent with a contact wound (Figure 6, right). The case was ruled a suicide.

Case—A 7-year-old girl was admitted to the hospital in an unconscious and convulsive condition. Her parents said that she had struck her head eight days previously when she had been knocked down by a playmate. On the day prior to admission, she had vomited several times and complained of headache. These symptoms were rapidly followed by convulsions, stupor, and coma. Diagnosis of probable intracranial injury was made, and she was prepared for craniotomy. She died while the anesthesia was being administered. At autopsy, a brain abscess (Figure 7, left) and localized meningitis were found. The paranasal air sinuses and middle ears were free of disease. The source of the metastatic abscess was discovered in the right main stem bronchus in the form of a rusted safety pin surrounded by a localized zone of suppuration (Figure 7, right). Thus death was due to an accident, but not to that assumed originally. The one responsible for the child's death occurred at some unknown time when the child aspirated the pin and failed to tell her parents about it. The importance of this type of case resides in its humanitarian implications. The little girl's mother had been extremely angry with the playmate, the child of a close friend, whom she had held responsible for a supposed fatal accident. When the exact facts were related to her, she was relieved of the bitterness that had compounded her grief.

Responsibility for the Death

On or within the body, there may be evidence that indicates directly those responsible for the death. A bullet recovered from a body can be traced to a particular firearm and thus help to indicate the probable killer. Foreign blood stains may provide valuable leads in tracing suspects. The many-sided role of pho-

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FIGURE 6

tography in the laboratory in such instances is well known.

Case—An unidentified body was found at dawn in an alley leading to a truck loading platform. The head had been crushed as though a wheel had passed over it. There were no other injuries. The pattern of two tire treads was distinctly imprinted on the victim's blue suit (Figure 8). The police traced every truck that had used the loading platform during the preceding 12 hours and found only one whose tires matched the marks on the clothing. The driver, a man with an excellent record, admitted that he had felt a bump as he drove out of the alley in the early hours of the morning. However, the surface of the road was rutted and irregular, and he had ascribed the bump to the poor condition of the driveway. He stated that he had not not seen anyone and had not suspected that he had struck the victim. The fact that the injury was confined to the head was taken to indicate that the victim had been sleeping in the road and had not been knocked down by the truck. This opinion was strengthened by a blood alcohol value of 0.30 per cent, which was sufficient to explain the possibility of his having gone to sleep in the road. Dark clothing made it difficult to discern the sleeping form. The driver was released.

MEDICAL STUDIES

WHILE the primary function of the coroner's office is the *medicolegal* investigation of the deaths that fall within its jurisdiction, valuable *medical* benefits also accrue from the post-mortem study of the pathologic material discovered at autopsy. The modern coroner should investigate 20 per cent of all deaths in a large community. His findings would comprise a variety of pathologic material not ordinarily available to the practicing hospital pathologist.

Sudden and unexpected death in infancy and childhood, a still incompletely solved problem, is an excellent example of a medicolegal question with strong medical overtones. The coroner's office can be the starting point for the pediatric pathologist who wishes to study this entity. An abundance of mechanical, thermal, and electrical traumas is seen in the day-to-day work of the medicolegal office, as are details of the pathologic anatomy of chemical injury and poisoning. The photograph (Figure 9) shows the appearance of the stomach of a child who

FIGURE 7 *(left)*

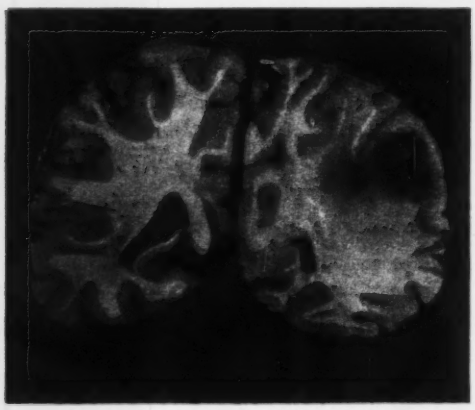

FIGURE 7 *(right)*

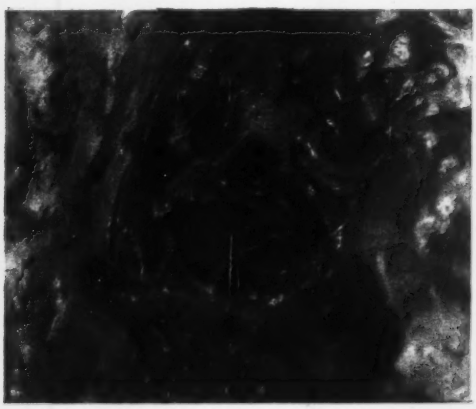

FIGURE 8

FIGURE 9

died as the result of poisoning by ferrous sulfate. The presymptomatic and preclinical stages of natural diseases, found incidentally in persons dying by violence furnish a basis for understanding the etiology and pathogenesis of clinical states. These are a few of the situations in which the coroner's office can serve as a reservoir for research material leading to rational therapy for poorly understood diseases. Photography helps in recording and imparting this information.

CONCLUSION

IT should be reiterated that the contemporary coroner's office is a multiphase institution. In its broadest concept, it functions as a public health office that utilizes knowledge acquired from the dead to make the community safer, healthier, and more law-abiding. With the proper support of the medical, legal, editorial, governmental, and lay segments of the community, it can render a unique service. Photography plays an essential part in the fulfillment of the many responsibilities that devolve upon the modern medicolegal office in its day-to-day activity and its long-range planning.

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The Striagraph: A New Police Science Instrument

By John E. Davis

EDITOR'S NOTE: *The author received his degree from the University of California at Berkeley in December 1941. He was employed in the Laboratory of the Missouri State Highway Patrol from February, 1942, until April, 1944. Since July, 1944, he has been employed as Criminologist in the Oakland, California, Police Department. During the past six years he has conducted extensive original research in the field of surface analyzing instruments for use in Police Science Laboratories. His work has led to the development of the "Striagraph," first described in articles presented in the* Fingerprint and Identification Magazine *published by the Institute of Applied Science, Chicago, Illinois, in their July through October, 1950, issues, and later in an article appearing in* The California Peace Officer *for July 1951. The present article describes the development and application of this new technique for analyzing toolmarks and bullets.*

THE identification of certain types of tool marks, and projectiles fired from rifled weapons, is one of the major activities of the average Police Laboratory. Marks left by various prying and cutting tools, and markings found on fired bullets, are identifiable because of the many microscopic "teeth" on the blade of the tool, or inside the barrel of a gun, which leave peculiar scratch marks or "striations" on metallic surfaces they contact. Thus, a safe door, a strong-box, a cash register, and so forth, will be marked by a pry bar applied to it during a burglary. Characteristic and identifiable marks may be found. In like manner, a bullet is marked in characteristic fashion by the particular weapon from which it was fired. Positive identification of the "striations" or fine parallel scratch marks on such evidence objects, provides absolute proof of their source.

Identification of any such marks consists in comparing them with "test marks" made with the suspected tool, or —in the case of bullets—comparison with "test bullets" fired from the suspected weapon. The actual comparison may be made by photographing "test" and "evidence" markings at great magnification and comparing the photographs. More commonly, however, the comparisons are made directly with the aid of a comparison microscope. This instrument permits the test and evidence marks to be examined at high magnification, and viewed in such a manner that they appear to be in juxtaposition, separated only by a fine line.

With the comparison microscope it is thus possible to compare directly the fine "hills and valleys" composing the two marks. By moving one or the other of the marks under the instrument, the operator is permitted to compare the striations at various positions until he has effected an identity or proved to his satisfaction that none exists. An identity is demonstrated when a sufficient number of the fine ridges match as to position and character.

In using the comparison microscope for such work, a low angle light is used to emphasize the ridges and valleys composing the mark. Such oblique light properly placed produces such highlights and shadows as to make the characteristic striations "stand out" so that they may be more easily compared.

The comparison methods described above have been applied as the standard procedure for a number of years. In fact, they have been the only means of satisfactorily comparing such marks.

The main shortcoming of the comparison microscope technique lies in the fact that the TRUE CONTOUR of striation marks cannot be determined. Thus, the relative height and depth of the "hills and valleys" composing a mark can only be estimated. The instrument is thus limited, in large part, to a magnification laterally, of scratch marks being examined. The depth-character of such striations, however, is equally important as an identification factor. It becomes apparent that some method of determining the "third dimension" of these striations would be most valuable as an aid to identification. Further, since the surface appearance of such striations (as viewed with the microscope) actually *depends* upon the contour itself, a contour analysis and identification would actually be more significant and positive proof of identity in many instances.

A still more important advantage of a contour analysis, however, rests in the fact that it could be quite an "objective" type of examination. Identifications effected with the comparison microscope frequently call for considerable "subjective" evaluation by the expert. Not only is it important that the marks be examined at identical magnification, and under identical lighting conditions, but the laboratory analyst must have a full appreciation of the fact that there are many instances where the "personal factor" plays a part in the result. Thus one man may see an identification, where another cannot; or, one man may believe he has effected an identification, where another, in light of his own experience, is less inclined to place so much confidence in an "identification" of the type viewed. Such opinions, at variance with one an-

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other, are due not only to the subjective element involved, but in large part to the mere fact that our analytical methods are not sufficiently complete. The closer one comes to obtaining a TRUE and a complete picture of something, the more likely he is to come to a proper and acceptable conclusion regarding it.

With these thoughts in mind, the author some time ago came to the conclusion that a contour analysis of striations would provide further important evidence upon which to base opinions. If one could obtain some sort of "graph" or picture of the *cross section* of a tool mark or bullet, in addition to microscopic photographs, the field of police science would have made an important step forward.

Research was begun on this subject by the author six years ago. The result of effort along this line has been the development of a new instrument for police laboratories —the STRIAGRAPH. The striagraph is an instrument designed to trace across the striations (hills and valleys) of a tool mark or bullet, and photographically record the contour traced as a graph or chart. This chart, or "striagram," shows in great detail the true relative height and depth of each fine ridge or line in the mark at great magnification. It is capable of revealing lines as close together as 0.0001 inch, and having a depth of as little as 0.00001 inch. In order to emphasize the contour, it is constructed to give a far greater vertical magnification than horizontal. This permits detection of smaller differences in height between various ridges, and a more accurate comparison of marks.

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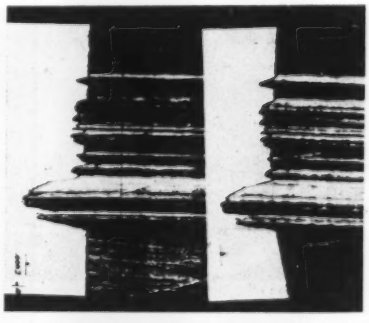


FIGURE 1. Copies of the tracings superimposed upon the original marks traced. Note how each striation has been traced and recorded. Observe that the method gives a much better indication of relative heights and depths than the microscopic photographs of the marks upon which they have been superimposed. (The marks are 1/10 inch wide.)

FIGURE 2. Photograph of the flat-specimen Striagraph. Microscope and lamp on the lower left. Fixed mirrors in the background project the image back to the recording drum on the right of the base-board. Moving specimen stage and tracing lever in the middle of the base-board.

The original investigation into this field was made with the aid of an instrument known as the "Profilograph," owned by the Timken Roller Bearing Company. There are also certain electronic surface analyzing devices manufactured for use in industrial laboratories. The striagraph, however, is less costly, less complex, and far better suited to police problems.

This instrument has been made in two models—one to analyze tool marks or other relatively flat surfaces, the other to analyze the surface of bullets or like curved-surface specimens. Through their use in the Oakland Police Laboratory much new information has been obtained regarding the character of both tool marks and bullets. Identifications have been effected through the resulting striagrams both in case and experimental work. Although the instrument is not to be construed as in any way replacing the comparison microscope, it does provide a totally new and different method of making such comparisons. It is far more "objective" in its analyses, and provides us with knowledge of features which heretofore could only be estimated.

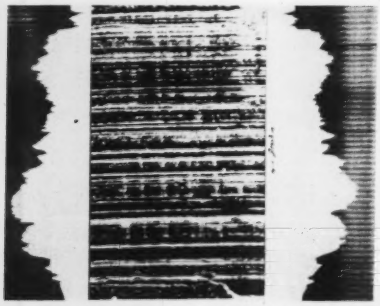


FIGURE 3. Tool mark approximately ¼ inch wide, with tracings on right and left. These tracings made on the Striagraph to illustrate the effect of running the tracing needle across the specimen in opposite directions. Note absence of directional distortion in the tracings. The tracing needle shows very little cutting of the specimen. Horizontal amplification on original approximately × 40; vertical amplification approximately × 400.

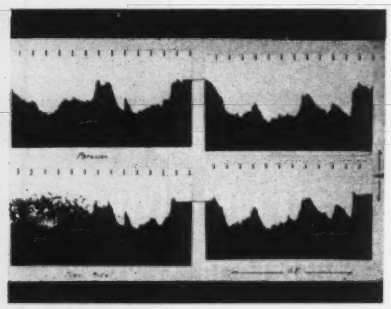


FIGURE 4. Two different test marks made with a single tool, analyzed with the Striagraph. The top set of marks made on paraffin. The bottom set on type-metal. The instrument will trace paraffin test marks without detectable cutting of the specimen. Some directional distortion apparent here (sawtooth appearance of characteristics) due to incorrect angular placement of tracing needle.

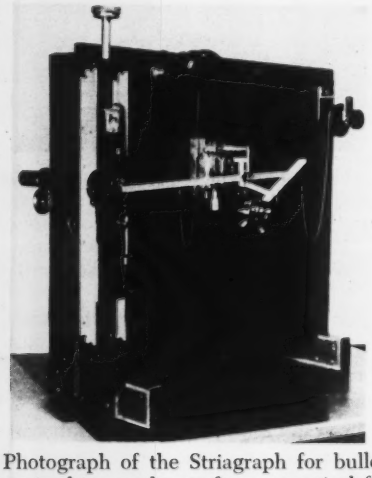


FIGURE 5. Photograph of the Striagraph for bullet analysis. Tracing lever in this case hangs from a vertical front-board, with bullet held in centering chuck at the middle of the front-board. Balance chains on both ends of the lever, with microscope on the left edge of the front-board. Lamp and fixed reflecting mirrors not shown. Instrument records on disc instead of a drum.

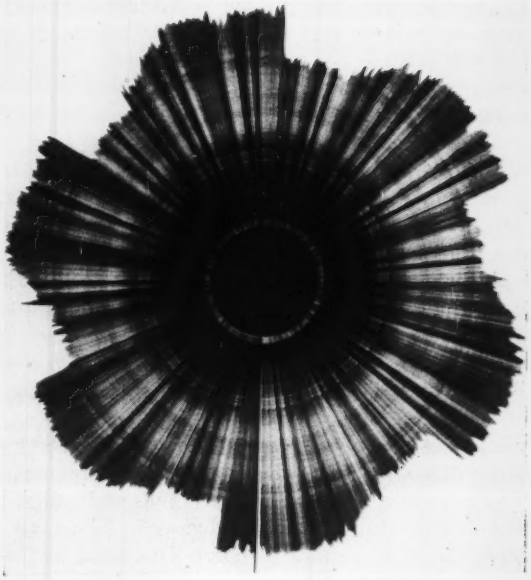


FIGURE 6. Tracing of a .45 caliber bullet fired from Colt Automatic. Note lands and grooves, plus minute striations shown around the periphery in "cross section." (Radial bands or lines from center outward are not significant and have no connection with the tracing.) *Original* magnification × 300 vertically and approximately × 30 "horizontally." Charts 18 inches in diameter.

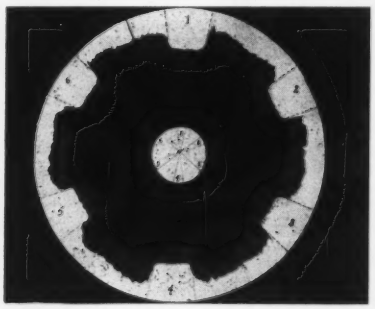


FIGURE 7. A .32 caliber bullet tracing. This bullet has been run twice on one chart. Note characteristics, plus identity of tracing on the two "runs." The instrument not only provides high fidelity, but exceptional consistency. The six grooves have been marked out. Note that lands and grooves may be measured in terms of degrees, with simplicity. Vertical magnification × 300; horizontal magnification × 30.

The Striagraph for bullet analysis offers an accurate means of measuring depth and width of lands and grooves, as well as a simple means of determining the angle of twist. It may permit positive demonstration that a certain weapon could NOT have fired a given bullet, even though it is of the proper make, model, and caliber. Most of these determinations have been made only with difficulty in the past. Thus has the instrument advanced our knowledge in this interesting phase of police work.

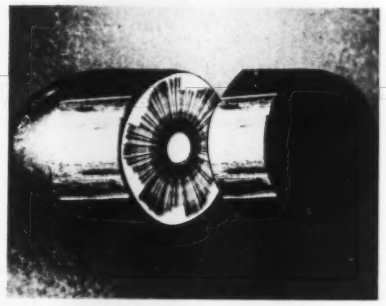


FIGURE 8. "Paste-up" illustration to show sectional view represented by these tracings. Only a microscopically fine line is traced around bullet. Three or four different lines have to be traced to obtain "average picture" of true contour.

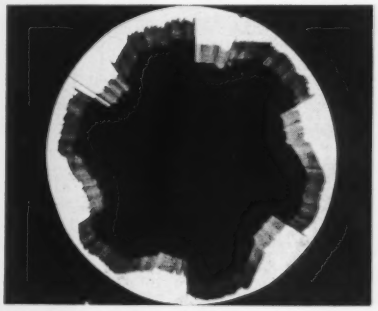
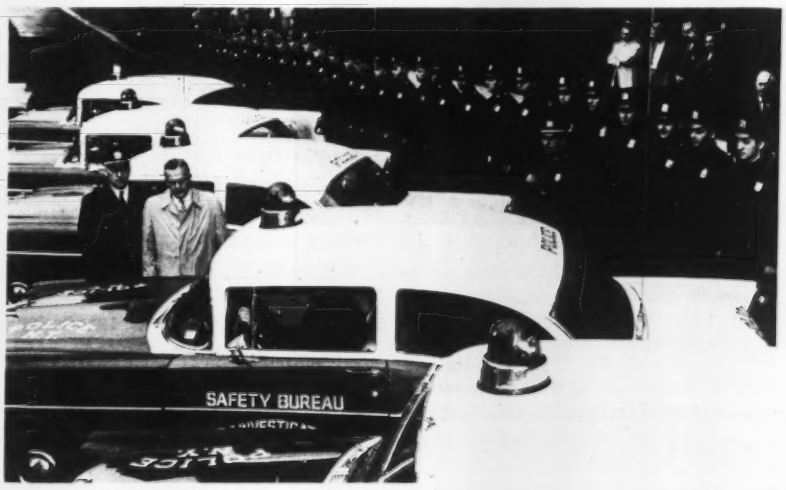


FIGURE 9. A different .45 caliber automatic bullet striagram. Two "runs" on one chart. Compare with Figure 9, fired from a different weapon.

New York Police Department Enlarges Accident Investigation Squad



Police Commissioner Stephen P. Kennedy announced enlargement of the Accident Investigation Squad by the addition of 40 patrolmen, 5 sergeants and a lieutenant and 5 specially equipped radio motor patrol cars. The squad, which seeks to ascertain causes of vehicular accidents, will be almost doubled by these additions. At the present time, the squad consists of 69 patrolmen, 4 sergeants and an acting captain and six cars.

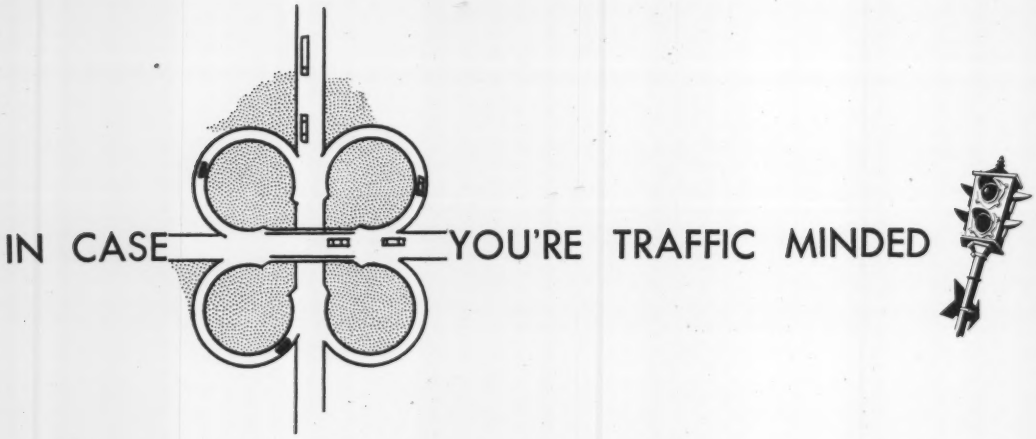
The Accident Investigation Squad members are trained in accident investigative techniques and, since the establishment of the squad, have responded to 1,207 accident scenes and investigated 1,576 cases involving drunken drivers. The squad has served 2,198 summonses for moving violations at accident locations.

Police Commissioner Kennedy said that the squad is one of the most effective weapons in the continuing fight against deaths, injuries and accidents on the streets of New York. Together with other special squads in the department and with the emphasis on traffic safety and enforcement by all members of the force, it has succeeded in reducing the deaths, accidents and injuries in New York City this year in the face of a continuing rise throughout the nation.

Since January 1 up to August 19 this year, *traffic deaths have been reduced by 16 per cent.* During that period there were 316 automobile deaths as compared to 375 in the similar period in 1955—a saving of 59 lives. *Injuries were reduced by 3 per cent* with 27,169 this year as compared to 28,018 last year—849 less. *Accidents were reduced by 4 per cent* with 20,353 this year as compared to 21,092 in the same period in 1955, a reduction of 739. The Safety Bureau of the Police Department also pointed out that there was one additional day this year, due to Leap Year, which brought the total up above the previous year.

The Accident Investigation Squad is assigned particularly to unearth facts beyond merely the place and time of occurrence of accidents in an effort to discover the "Why" of such fatalities.

The new men added to the unit were carefully selected for the work. Eighteen of them are college graduates, ten have three years of college, five have two years of college or its equivalent. Each of the cars assigned to the unit carries full accident investigation equipment, including a measuring tape and decelerometer for determining the speed of vehicles as well as for the testing of brakes. The cars also contain a drunkometer for determining intoxication by chemical process, and a Speed Graphic camera for photographing accident scenes. Members of the expanded unit, as well as all members of the department, were directed by the Commissioner to take immediate action against violators of the fourteen moving violations which are found to be the cause of most accidents. The Commissioner urged both pedestrians and motorists to use care and caution in their driving and walking habits to help keep the death rate down.



The Question of Motor Vehicle Safety Seat Belts

EDITOR'S NOTE: *The increasing interest on the part of both the part of both the police and the public in motor vehicle safety seat belts has resulted in increased installations of this type of safety equipment on automobiles to improve the chances of crash survival. As in the case of any type of equipment, it is apparent that motor vehicle seat belts must necessarily meet certain minimum specifications if they are to serve their purpose. The following information regarding safety seat belt standards is presented through the courtesy of the Society of Automotive Engineers, Inc., Twenty-nine West Thirty-Ninth Street, New York 18, N. Y. This organization appointed a special committee to make a study of seat belt assemblies and its report is manifestly one that will prove of interest to police personnel across the country. The reader can look forward to addtional material on this subject in future issues.*

THE committee was organized by the SAE Technical Board in September 1954 to investigate and report with recommendations on engineering problems presented by the application of lap-type seat belts to motor vehicles. The committee's assignment does not include an over-all evaluation of seat-belt potentialities in reducing injuries in accidents, and the committee has not considered that subject. In its work to date the committee itself and its individual members have endeavored to follow up available sources of information bearing on the seat belt problem. A bibliography developed and reviewed by the committee is appended to this report.

The prime engineering question presented by the application of lap-type seat belts to motor vehicles is what minimum strength should be used as a basis for design of the installation. While there does not appear to be, at this time at least, any rational basis for determining an optimum value for minimum strength, there is, however, a developing body of opinion that the minimum strength of the belt assembly should be 1500 lbs. in tension, and a loop strength of 3000 lbs. under specified test conditions.

These values are in agreement with Civil Aeronautics Authority requirements for belts used in civil aircraft. Belts meeting these requirements have been in substantial production for use in aircraft over a considerable period of time and hence these minimum strength values would appear to present no manufacturing problems.

A loop strength of 3000 lbs. approximates the load which "a 150 lb. average man" frequently used in design calculations, would place on the belt in a 20 g deceleration. This value for deceleration incidentally is about what anthropometric dummies are subjected to in experimental crashes into rigid barriers at speeds of the order of 20 mph., and at somewhat higher speeds in car-to-car collisions. An estimate of human toleration for force exerted by the lap-type belt, made by Col. J. P. Stapp of the Air Force is of interest in this connection and for this reason is quoted in a footnote.*

If the belt, including buckle and length adjustment, are to be designed for 3000 lb. loop strength, obviously it is

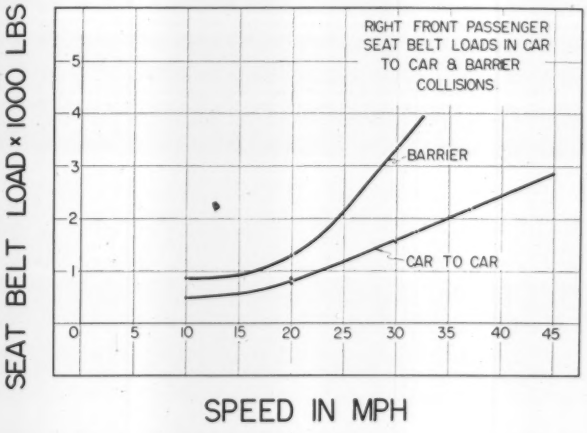
Address: Mr. Don Blanchard, Society of Automotive Engineers, Inc., 29 West 39th Street, New York 18, New York.

*Excerpt from AF Technical Report 5915—*Human Exposures to Linear Deceleration*, Part II, dated Dec. 1951—John Paul Stapp, Major, USAF (MC)

a. *The Lap Belt.* Assuming the usual width of 2 *inches*, the average occupant of an aircraft seat equipped with a lap belt will impinge against approximately 20 inches of its length across the anterior aspect of his trunk. In order that it can have any protective function against crash forces, the occupant must have at least forty inches of forward clearance to avoid striking his head against obstructions as his trunk swings in an arc around the belt

desirable that other load bearing elements of the installation be at least equally strong. In other words, for a balanced installation, each of the fittings attaching the belt ends to the anchorages should be good for at least 1500 lbs. and the anchorages together should take sum total loads of at least 6000 lbs. for two belts and 9000 lbs. for three. It is important also that the force required to open the buckle after loading not exceed a reasonable maximum.

According to information collected by the committee, most seat belt manufacturers recommend that belts be anchored by bolts passed through the floor pan of the body with the bolt heads bearing against flat washers two to three inches in diameter on the under side of the pan. The committee has carried on tests on new 1955 bodies made by five different manufacturers to determine what loads this type of anchorage might be expected to carry. In these tests 3/8 in. anchor bolts were used with reinforcing steel washers or plates on the top and under side of the floor pan. These washers or plates were 1/8 in. thick and had an area of about 8 sq. in. The



← *Footnote continued from previous page—*

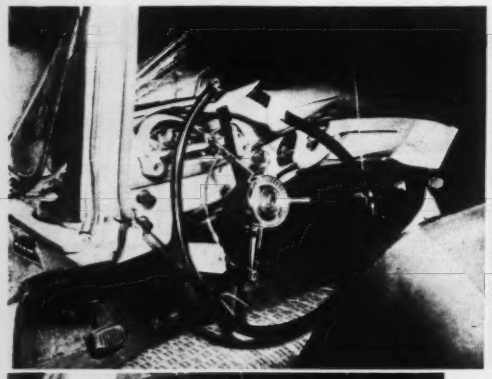
as a fulcrum; the belt must pass through the crease of the hips to avoid bearing against the abdomen, and the load must rest against all 40 square inches of presented surface, not against an upper edge, or a doubled belt. Under these ideal conditions, the 200 pound occupant will sustain a load across his pelvis of 5 pounds per square inch per g. At 20 g, this is 100 pounds per square inch, and at 40 g it is 200 pounds per square inch. The maximum pressure listed in Table II, Column K is 36.5 pounds per square inch under actual test conditions. While this is by no means the limit of tolerance, it would be rash to recommend more than three times this value as the extreme limit for the safety belt alone, operating under ideal conditions, such as in a laboratory. In actual practice, the occupant seldom is given 40 inches of unobstructed forward clearance in which to jackknife his body, the angle of applications of force may pull him partly or completely out from under the belt, or impinge his lower abdomen along one edge or a doubled V of the webbing, or the belt may catch under the margins of the ribs across the upper abdomen. The effect of 100 or 200 pounds per square inch in shear on these soft tissues and the organs underneath is almost certainly to rupture and tear.

test set-ups simulated a three-belt installation—that is, there were four anchorages with two belt ends being attached to each of the inner anchorages. Balancers were used to distribute the load among the anchorages.

In these tests anchorages for front seat belts withstood total loadings of 5000 to 9000 lbs. As these loads were approached floor pan deflections increased rapidly so that it was not practical to increase the load further. These deflections, measured in the direction of loading, ranged from 2.35 to 5.35 in. for the two inner anchorages and from .30 to 1.93 in. for the two outer anchorages.

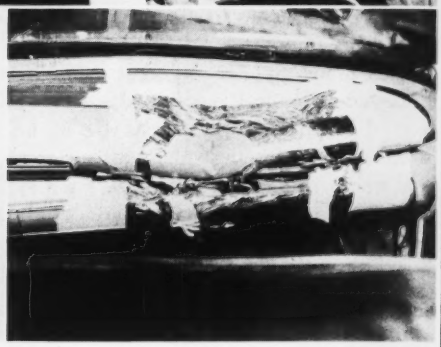
The range of loads which anchorages for rear seat belts withstood was from 5500 to 9000 lbs. In these tests the deflections, measured in the direction of loading, ranged from 1.76 to 7.75 in. for the inner anchorages and from .17 to 5.60 in. for the outer anchorages.

These tests were made under what amounted to static conditions and it appears probable that somewhat higher loads might be absorbed under crash conditions because the forces are in action for only a small fraction of a second. The bodies used in these tests were all in new condition and hence the floor structure had not been subjected to corrosion or other deterioration which could reduce the strength of the floor pan structure and exposed attachments unless they received regular maintenance to protect against corrosion.

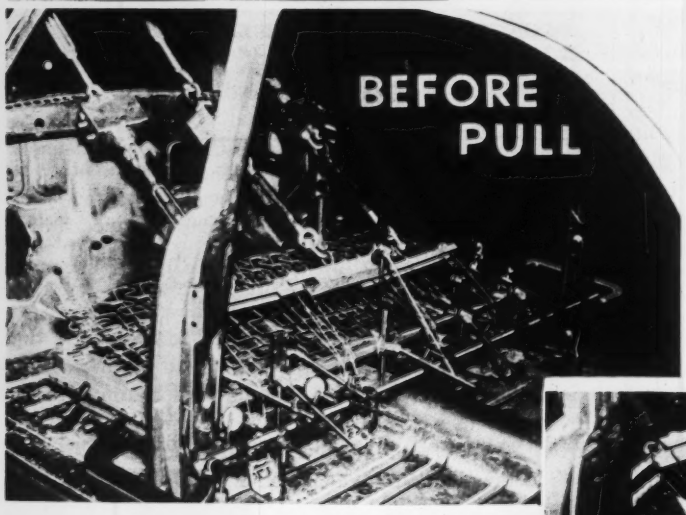


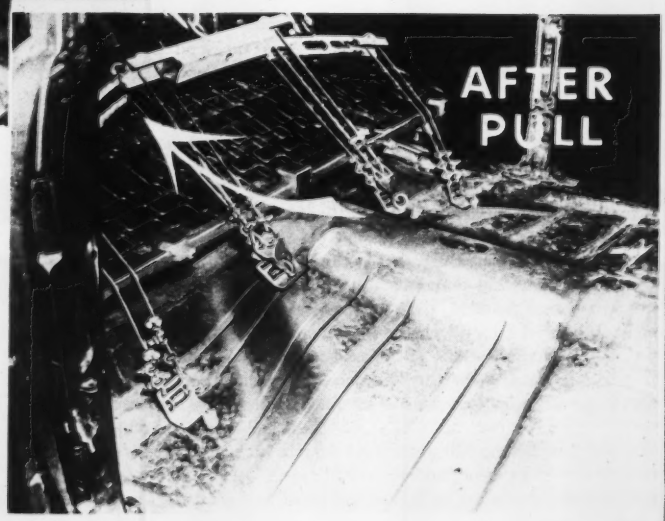
NO BELT WORN

WEARING SEAT BELT



Pictures at top of page show the results of body impact with and without the safety feature of seat belts.





Pictures at bottom of page show result of pull test on automobile body floor. Structural requirements have been established for adequate seat belt installation to withstand the forces developed during collisions. *(All pictures are presented through the courtesy of the Ford Motor Company.)*

The committee has developed a recommended practice for seat belt assemblies. Copies may be obtained from the Society.

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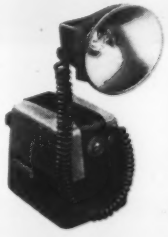

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Sleepy Driver Guilty of Reckless Homicide

A 1953 decision by the Supreme Court of New Jersey graphically illustrates the criminal responsibility incurred by one who drives an automobile in a state of exhaustion due to lack of sleep. In the case of In re Lewis, (Jan. 19, 1953) 94 A. (2nd) 328, four teen-age boys who had summer jobs at a Catskill Mountain resort drove down to New York City after work one August evening to see the big town. After an all-night round of the sights they were hurrying back to work in the early morning hours. Three of them were asleep in the back seat and the last thing any of them remembered was that Lewis was driving and definitely refused offers of the others to take his place at the wheel even though he was very tired.

The accident occurred as they were passing through East Paterson, New Jersey. Lewis had no recollection of it and admitted that he may have fallen asleep. Thus, as the court remarked, "the evidence of his inculpatory conduct was entirely circumstantial." A witness standing on the curb waiting for a bus testified that he saw the car coming down the highway "pretty fast," that it veered gradually to the right, jumped the curb, struck a woman who was also waiting for the bus and crushed her to death against a telephone pole. The car then "bounced and made a turn" across the street and crashed into a tree on the opposite side. One of the boys in the back seat was killed.

Defendant was prosecuted under a New Jersey statute making it a crime to cause the death of another by driving a vehicle carelessly and heedlessly in wilful or wanton disregard of the rights or safety of others. (N.J.S.A. 2A: 113-9.) The court, (per Brennan, J.) in discussing the sufficiency of the evidence to sustain a conviction, said:

"The offense condemned may be committed by the driver of a motor vehicle who causes the death of another when there inheres in his driving the high probability of causing harm because of conditions known to him which actually impair, or potentially have the capacity to impair, his faculties for vigilance and care. It is not necessary to show ill will toward, or a positive intent to injure another in order to establish that a motor vehicle was driven in wilful or wanton disregard of the rights or safety of others. True, conduct which is wilful or wanton, unlike conduct which is merely negligent, does import intent. However, the element of intent to harm is supplies by a constructive intention as to consequences, which entering into the intentional act which produces harm, namely the driving of the vehicle, the law imputes to the actor, so that conduct which otherwise would be merely negligent becomes, by reason of reckless disregard of the safety of others, a wilful or wanton wrong. The emphasis is upon the reckless indifference to consequences of the intentional act of driving the motor vehicle in the face of known circumstances presenting a high degree of probability of producing harm. . . ."

Similar holdings in cases involving sleeping drivers are: People v. Robinson, (Mich. 1931) 235 N.W. 236; Johnson v. State, (Fla. 1941) 4 So. (2nd) 671; State v. Olsen, (Utah 1945) 160 P. (2nd) 427; Note: 160 ALR 508.

In a case decided in 1951 the Appellate Division of the Superior Court of New Jersey had held that a driver who "blacks out" because of a disease with which he knows he is afflicted and thereby causes the death of another is guilty of manslaughter. State v. Gooze, 81 A. (2nd) 811. (Robert L. Donigan, Counsel and Edward C. Fisher Associate Counsel N.W.U. Traffic Institute.)

Make your pictures count!

One should be careful to include in a photograph enough of the area around the accident, to show clearly what was the position of the participating vehicles. From the upper photograph, alone, it might be very difficult to determine which of the vehicles was in violation. The lower photograph illustrates how a photographer should provide for sufficient over-all coverage in his illustration. There could be no question, in this case, that the truck was cutting the corner and was on the wrong side of the street. (From Williams, C. A.: *Traffic Accidents.*)

Action on Many Fronts to Stem Rising Traffic Toll

Throughout the nation, the growing alarm over the mounting traffic toll is being translated into action. During the past several weeks definite steps have been taken by many groups to stem the rising traffic tide.

Meeting in Atlantic City in July, 1956, the 48th annual governor's conference appointed a committee to bring in recommendations to meet the situation.

The committee's major work will include:

1. Adoption of a uniform set of motor vehicle laws.
2. Uniform enforcement of motor vehicle laws.
3. Nationwide reciprocity in upholding convictions and penalties resulting from the enforcement of motor vehicle laws.
4. Development of state and community-wide programs for safety education.

The Workshop of the Traffic and Transportation Conference, held in Chicago on June 20, laid plans for a vigorous year-long "Back the Attack on Traffic Accidents" program. This program will start with a month long emphasis in December, with continuous follow-up throughout the year. The December emphasis will replace the S-D emphasis which the Advisory Council of the President's Committee for Traffic Safety has postponed until sometime in 1957. All member organizations and groups of the T & T Conference will participate in the "Back the Attack" program. It will be tied in closely with the National Safety Council's "Operation Safety" program, the Ad Council's "Stop Accidents" program and the Outdoor Advertising campaign. This action initiates a sharp stepping up of the tempo of the long range program for traffic safety improvement announced last March.

In Washington, the house interstate and foreign commerce committee's special subcommittee on traffic safety announced that it will conduct hearings in cities throughout the country to investigate the "terrifying traffic death toll."

The subcommittee hopes this study will result in discovery of methods for reducing the traffic death toll. The investigation will cover five general areas—the human factor, legislation, private vehicle design, highways, and law enforcement.

Also in Washington, the president signed the Federal highway bill of 1956. This bill contains Senator Margaret Chase Smith's amendment in which the Secretary of Commerce "is authorized and directed to make a full and complete investigation and study for the purpose of determining what action can be taken by the Federal Government to promote the public welfare by increasing highway safety in the United States."

Elsewhere in the nation, the influence of the recent Regional Conferences of the President's Committee for Traffic Safety is being felt as returning delegates organize new community traffic safety groups or reactivate existing groups. The objective of these conferences, which were held in the East, South, Mid-West and West during May, was to attract, stimulate, inform and assist those persons who could most effectively create, finance, and conduct state and local citizens' traffic safety organizations.

Editorial

POLICE, a conservative Journal devoted to the professional interests of law enforcement personnel everywhere, made its initial appearance in September of this year. In the ensuing issues, through the months and years ahead, it is evident that the opportunity will be presented to serve the investigative and related fields along a broad front. Dedicated to a career service and to professionalization, the pages of the Journal will reflect the interests of workers in all branches of the service and at all ranks from the administrator to the new recruit.

The editorial staff is more than well pleased with the response from the field, both with respect to the number of feature articles of professional calibre that have been received, and openly expressed opinions concerning the need for a Journal meeting the specifications and requirements of this professional field. The circulation of the Journal is already national in scope with an increasing number of foreign subscribers. With this auspicious beginning, POLICE looks confidently ahead to a long period of growth and development that may well prove to be without parallel in the investigative services.

Experience thus far points to a virtually unlimited reserve of important materials in the police and related fields that have for some time been awaiting appropriate opportunities for publication and dissemination to the field. The content of these professional contributions is a measure of the need for making them available to investigative personnel throughout the country. They come from a wide range of sources, indicative of the broad application of most, if not all of the arts and sciences in this branch of the public service.

Contributing authors in the issues ahead include, in addition to workers in related professional fields, police administrators, supervisory and command personnel, and men in the ranks whose experience, qualifications and developed writing interests place them in a strong position to make important contributions.

Among the ideals of a profession is the ambition to advance and to keep abreast of new and tested developments in the field. Toward this end, the columns of the Journal are dedicated to serving the interests of all personnel in the law enforcement services as an important and effective channel of contact and communication.

The Sunnyvale Public Safety Department: A Study in Integration

By Jacob A. Jessup

EDITOR'S NOTE: *The growing increase in costs and demands for municipal services has led a substantial number of local units of government to consider departures from orthodox patterns of procedure in an attempt to maintain acceptable standards of service within the limits of funds available. Among the new innovations that have appeared on the scene, the integrated organization of police and fire services into one department, particularly in the smaller community, is one that has captured the interest of municipal administrators across the country.*

In the following article, Chief of Public Safety Jacob A. Jessup reports on the operation of the integrated system in Sunnyvale, California during the past five and one-half years. The reader will be particularly interested in the comments of Sunnyvale City Manager H. K. Hunter near the close of the article. Chief Jessup was formerly a detective in the Police Department of Wenatchee, Washington. He resigned that position in 1945 to enroll in the police major at the State College of Washington, where he took the B. S. degree in police science and administration in 1949. At that time, he accepted the post as Chief of Police in Kennewick, Washington and subsequently was extended the invitation to become Chief of Public Safety in Sunnyvale, where he now presides over this combined organization.

INTEGRATION of the Police and Fire Departments of Sunnyvale, California, was accomplished July 1, 1950. At that time, the Police Department consisted of sixteen employees and the Fire Department had a paid Chief, together with approximately thirty volunteers. The volunteers disbanded willingly.

Upon unification, the Chief of Police and the Fire Chief were given the rank of Captain in the newly formed Department of Public Safety. The new Chief, a retired Battalion Chief of the Los Angeles Fire Department, was employed on a temporary basis for a period of six months, for fire training. However, it would have been more appropriate to employ a permanent chief at the time of the unification of the departments, and utilize personnel within the department for training duties, or make other arrangements such as taking advantage of locally and state sponsored training programs.

Complete unification was accomplished and all employees of the department lost their identity as to police or fire service, per se, and became public safety officers with appropriate designations of rank, uniforms, insignia, etc.

It is natural, and indeed desirable that there should be some specialization within the department. But it is also imperative that all officers be trained to perform any and all duties that are required at the scene of any given emergency. All members of the department are trained to do a creditable job on either police or fire assignments.

Among the more important things necessary for the successful operation of the combined department are the attitudes, adaptability and training of the personnel, and a firm belief on the part of the administrator in the practicability of unification. The personnel selected thoroughly understand that they are subject to training for assignments in both the police and fire services. After they have received training in both fields, they are assigned according to the requirements of the department with consideration given to the capabilities of the individual.

We are often asked the question, "What would you do if you had a fire and a police incident occurring simultaneously?" We feel that a situation such as this presents problems no more difficult than to have simultaneous incidents occurring in the same field and that as in any other emergency, most attention would be given to the most hazardous condition. We recognize, as any police or fire administrator would, that emergencies may arise which tax the capabilities of any one department to handle with their normal strength. We think that the more flexible feature of the integrated organization places the Public Safety Department in a stronger position to accommodate these peak loads than could separate departments.

Opponents of unification have insisted that it is beyond the capabilities of an individual to prepare himself to do a job in both the police and fire fields. Recognizing that the individual probably won't be as proficient in both fields as he would be were all his time devoted to one activity, we overcame this deficiency by having some individuals specially trained for specialized tasks.

We believe that one of the continuing problems of most administrators is the tendency toward over-specialization. This must be guarded against in unification of the police and fire departments. Each individual must be capable and willing to perform any task in cases of emergency. We have a continuous training program in the fire function. We do not neglect training in the police function. It has been our actual experience that the peak demand for personnel is greater from a fire than from a police incident.

By 1951, the Pacific Coast Board of Fire Underwriters released the results of its regrading of the city's fire defenses. Deficiency points were reduced from 2,995, or

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Class 6, before the merger of the two departments, to 2,431, and this resulted in placing the city in Class 5. The change from Class 6 to Class 5 resulted in a reduction of from 8½ to 10 per cent in fire insurance premiums on residential property. The total savings to property owners in reduced premiums was estimated at $30,000 a year, which is equivalent to 22.7 cents on the tax rate.

The operation of the new public safety department during the emergency occasioned by a tornado on January 11, 1951, probably contributed more than any other single event to public acceptance of the combined department. The tornado struck at 8:20 A.M., causing over $1,000,000 in property damage. All departmental personnel were called on duty and performed both fire and police duty as needed throughout the day. This experience proved beyond doubt the value of utilizing personnel where needed by shifting men between fire and police assignments and it showed to full advantage the degree of coordination possible in an integrated department.

Following is our operational pattern in an actual fire emergency:

First Alarm

Dispatch all men on duty. If Officer in Charge desires additional help, he shall order by radio the number of off-duty men needed.

General Alarm

1. Dispatch all men and all equipment to the scene of the fire.
2. Calling of off-duty men is to be done by telephone in the order shown on the desk roster.
3. All Public Safety Officers will perform such duty at the scene of a fire as the senior officer present deems expedient in order to get extinguishing apparatus into operation with a minimum of delay.

As will be noted from the above, all men on duty at a given time respond and work at the scene of a fire. (This, of course, would include all men off duty who were called for the emergency.)

Those men assigned to patrol duty responding to a fire will, of necessity, be dressed in uniform. The City reimburses the men for any uniforms soiled or destroyed as a result of work at the scene of an emergency. This expense has been negligible in six years of operation.

A somewhat detailed description of the duties performed by certain individuals of the department will indicate some of the advantages of integration. There is a captain in charge of each shift and he exercises general supervision over all operations during his tour of duty. There are presently three captains in the department although the authorized strength is four.

A lieutenant is on duty at the headquarters station on

Chief Jacob A. Jessup

each twenty-four hour tour of duty; he is in direct charge of fire fighting tactics and day to day fire training and employment. As set up on the duty schedule, the lieutenants work one less shift each twenty-four day period than do the other men assigned to the stations, but this will be "paid back" during the vacation time when they will work straight twenty-four hours on and twenty-four hours off.

Lieutenant Riemer, assisted by officer Swenson, has overall supervision of fire training and fire prevention work. In addition to his fire prevention duties, officer Swenson, a former journeyman automobile mechanic, supervises the servicing and maintenance of all fire and police automotive equipment.

Communications officers Spencer, Kannegaard, Finch, Alquist and Hardison receive and record all police and fire calls, dispatch officers and equipment, book prisoners, license dogs and bicycles, register voters, prepare records and reports; keep crime, traffic and fire statistics, issue burning permits and perform other general duties incidental to the operation of the headquarters office.

Lieutenant Myers does major investigations of crime as required, maintains liaison with other departments, supervises preparation of cases for court, exercises general supervision of records practices and procedures, supervises firearms training and reloading of ammunition. Officer Crabtree enforces the parking meter ordinance particularly and performs other general duties.

Officers Cook and Penfold are motorcycle traffic men. Officer Cook accomplishes follow-up work as required. All other personnel perform general patrol duties unless otherwise required in an emergency.

Station personnel accomplish all those duties peculiar to fire stations such as maintenance of quarters and equipment, care of grounds and engage in regular drills. In addition to these regular duties in the fire station, the men do all fingerprinting, license bicycles and assist in the office occasionally.

It has been stated that we do not have integration of police and fire services in Sunnyvale. We do not attempt to create the illusion that any man may do two things at once or that any man's duty assignments are changed hourly, but we have trained our personnel to perform at a given task with a high degree of efficiency and at the same time be prepared (professionally and mentally) to accomplish other work as exigencies demand. The following examples will illustrate.

1. Captain Brown apprehended two suspects in a stolen car. He requested assistance. Lieutenant Riemer and officer Swenson at headquarters, working on pre-fire planning, were dispatched to assist.

2. Lieutenant Elliott entered a burning house to rescue victims; he was assisted by officer Crabtree (on patrol duty) in manning an inch and a half hose line.

3. Officer Spradlin (on patrol) entered a living room and removed a burning davenport prior to the arrival of fire equipment.

4. Officer Lillie detected fire in a truck prepared for sleeping quarters, and removed occupant to safety.

5. Officer Penfold (on patrol) arrived first at scene of a gas explosion in a residence and manned first hose line to fire.

Almost without exception our men on patrol arrive at fire grounds ahead of fire equipment and they give directions, assist in laying hose, aid in hooking to hydrants, in extinguishing fire and generally perform services in accordance with the policy of the department as stated in item No. 3 under the section headed "General Alarm."

Supervisory, Patrol and Communications personnel work a 40-hour week. Station personnel are assigned to the stations on a 24-hour on and 24-off shift with an extra day off every eighth day. The latter shift is a 63-hour work week but includes only three shifts out of each eight day cycle. We experience no dissension in the

Robert M. Alquist, Records and Communications Desk, Police and Fire.

department because of this seeming differential in the work week.

The salary scale of the department may prove of interest:

NEW PAY SCALE EFFECTIVE JULY 1, 1956

Class Title	*Salary Range*
Public Safety Captain	439 - 459 - 480 - 502 - 525
Public Safety Lieutenant	420 - 439 - 459 - 480 - 502
Public Safety Officer	383 - 401 - 420 - 439 - 459
Communications Officer	319 - 335 - 350 - 366 - 383

With satisfactory performance an individual may reach the top of the scale in 3½ years.

Personnel are granted ten working days vacation, accumulate ten days sick leave and receive nine holidays annually.

In summing up the operations of the Department of Public Safety in Sunnyvale, City Manager H. K. Hunter stated:

"At the close of the fiscal year we will have completed six full years of operation of an integrated police and fire department. During these six years we have consistently improved our operation by concentrated training of all officers in both fields. We have operated during the entire six years without the use of volunteers. During the time of our operation we have received requests for information concerning the integrated system from well over two hundred cities in this country and, in addition, requests from Hawaii and Canada.

"A number of cities have sent teams of experts and administrators to examine the operation and wherever this first hand survey has been conducted we have received a favorable report.

"In September 1955, the official special census showed a population of 26,064 and we have 41 paid officers in the following ranks:

1 Public Safety Chief
4 Public Safety Captains
5 Public Safety Lieutenants
5 Communications Officers
26 Public Safety Officers

"Men in the Department have worked extensively in both fields.

"After six years of operation we are more convinced than ever that the goals aimed for in the integration of the Department are being achieved today:

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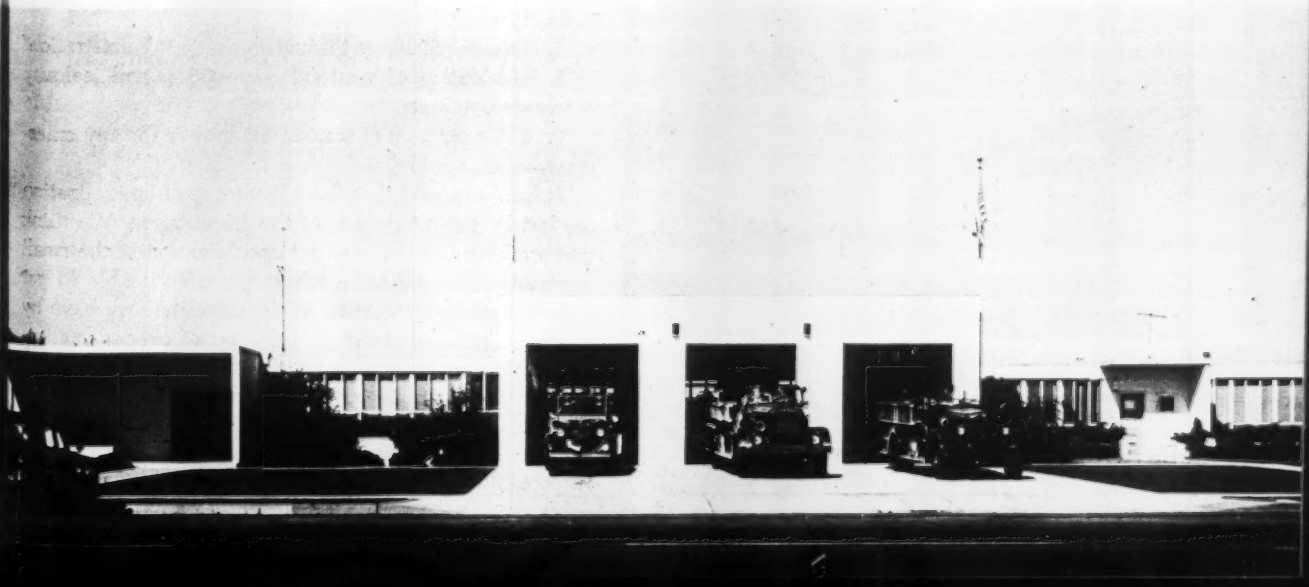

Upper left: Public Safety Officer John E. Haag.

Upper right: Lt. John D. Davis (front), and Public Safety Officer Harold K. Adamson (rear).

Center left: Lt. Allen D. Riemer (rear), and Public Safety Officer Ingwald S. Swenson (front).

Center right: Public Safety Officers John E. White (left), and Richard D. Blanc (right).

Lower left: Lt. John D. Evans.

"1. A 20 to 25% saving in personnel and equipment costs.

"2. Shorter working hours and better pay for better trained men.

"3. A saving in having one headquarters building instead of two.

"4. Greater efficiency through a single administration.

"5. Elimination of wasteful competition and jealousy of two departments.

"6. A greater pool of trained manpower for any emergency—police or fire.

"It has been said that the advantages of specialization are lost by the integration of the Department. We think that we have been able to get specialization in the small department in vital areas where we were unable to get it in separate departments. At the same time we have by and large eliminated the wastefulness of over-specialization which creates men in uniform in idle reserve. By pooling our manpower, our leadership and our other resources in a single integrated department we have achieved a well-directed force capable of handling the responsibilities of both the police and fire services."

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POLYGRAPH and INTERROGATION

Edited by ROBERT D. STEEL

EDITOR'S NOTE: *In keeping with the policy of the Journal to present special Sections devoted to the interests of particular professional groups within the field, it is a pleasure to make possible the first appearance of the Section on POLYGRAPH AND INTERROGATION. The materials presented in the issues ahead will be concerned with research developments, know-how, new techniques and procedures, new developments in instrumental design, and related subjects. While the Section will prove of special service to polygraph examiners and other workers in this specialized field, feature articles and other materials presented will be of interest to all personnel in law enforcement organizations, large or small, as an important step toward sharpening those investigative skills that lead to case clearances.*

This special new feature of the Journal will also prove of particular interest to members of the Academy for Scientific Interrogation who, at their 1956 Seminar-Convention held at the State College of Washington, September 23, 24, 25, gave their unanimous approval to editorial policy in establishing a direct and effective outlet for the exchange and dissemination of ideas and information in this highly specialized field.

The Section will be edited by Mr. Robert D. Steel of San Diego, California, a veteran polygraph examiner and one of five men who have successfully passed the certification procedure developed by the Academy.

Robert D. Steel took the B.S. degree at Sam Houston State Teachers College, Huntsville, Texas, in June 1941; graduated from Northwestern University Midshipmen's School, Chicago, Illinois, in May 1942 and was commissioned an Ensign in the U. S. Navy, following which he served as Executive Officer of the CGR-309 at San Pedro in 1942; Commanding Officer of the U.S.S. Sea Scout (PYc43), an Anti-Submarine Warfare training ship off San Diego, in 1943; and First Lieutenant, Sonar and Radar Officer, on the U.S.S. Osterhaus (DE-164) in the South Pacific and Far East area for the remainder of World War II. From December 1945 to June 1948, Mr. Steel was employed by the U. S. Treasury Department, during which time he became active in Naval Reserve activities and changed his classification from Deck Officer to that of a Specialist in line with his investigative interests. Since July 1948 Mr. Steel has been under contract to the U. S. Navy, in a confidential position, and since graduating from Keeler Polygraph Institute, Chicago, Illinois in 1951, has acted as polygraph examiner for the 11th Naval District, in addition to his other investigative duties. Mr. Steel was the fourth member of the Academy for Scientific Interrogation to be awarded a "Certificate of Qualification." Since 1954 he has done graduate work at San Diego State College toward a master's degree.

V. A. LEONARD,
Editor of the Journal.

The Rights of the Subject in Lie-Detector Interrogation

By William Dienstein

EDITOR'S NOTE: *Professor William Dienstein took his A.B. degree at Stanford University in 1931, the M.A. degree at the University of California in 1939, and during 1952-53 took advanced graduate work at Stanford. He organized and administered the Department of Criminology at Fresno State College from 1946 to 1950 and is now Associate Professor of Social Science and Criminology at that institution. During World War II, he was an instructor in the Provost Marshal General's School, 1942-44; Criminal Investigator and Administration Chief of the Crime Laboratory, Philippine Islands, 1944-45; Korean action—Assistant Chief Criminal Investigation, Sixth Army, 1950-52; Major, M.P.C. U.S.A.R. Professor Dienstein is author of the books* Technics for the Crime Investigator *and* Are You Guilty? *and a contributor to the professional journals.*

A REVIEW of the literature on the lie detector shows little has been written on the rights of the subject in lie-detector examinations. Court decisions touch on the rights of the subject when there is a question of the voluntariness of a confession subsequent to a lie-detector test.

Even though a study of court cases involving the use of the lie detector since FRYE V. UNITED STATES[1] in 1923, shows that the results of lie-detector tests have not been admitted into evidence on appeal with but two exceptions, NEW YORK V. KENNY[2] and CALIFORNIA V. HOUSER,[3] it is interesting to note that the basis for appeal in several cases has been the denial of a lie-detector test to the

Address: Professor William Dienstein, Fresno State College, Fresno, California.

[1] FRYE V. UNITED STATES, 283 F 1013 (1923).

[2] NEW YORK V. KENNY, 3 NYS 2d 328 (1938).

[3] CALIFORNIA V. HOUSER, 193 P 2d 937 (1948) on stipulation by both parties. Contrary to the general rule under which the results of a lie-detector test are inadmissible, it has been held that the defendant's act of taking the test or the results of a lie-detector test are admissible on the question whether the confession made by him was voluntary. See LEEKS V. OKLAHOMA, 245 P 2d 764 (1952). TYLER V. U. S., 343 US 908 (1951).

defendant.[4] The request for lie-detector examination has been denied on appeal as the "results of such tests are not evidence admissible upon trial."[5] It is possible that when the lie detector does become judicially acceptable, the subject in an investigation and subsequent court proceeding may have the right to demand a lie-detector test, but at the present time at least it is not so.[6]

A "USEFUL INSTRUMENT"

Thus far, according to the appellate courts, the lie detector is a useful instrument for police investigation,[7] for uncovering clues,[8] and for obtaining confessions.[9] The courts—

> do not exclude the lie detector as an instrument of investigation. Nor does it mean that its use may not be shown as a step leading up to a confession. . . .[10]

It has been held that the employment of a lie detector during an interrogation does not of itself render a confession inadmissible.[11]

Though the—

> lie detector is not judicially recognized and it is an error to project its results into a criminal case, the taking of the test may be considered by the jury along with all the other evidence concerning confessions in determining whether the confession was freely and voluntarily given.[12]

Since confessions achieved as a result of a lie-detector test are subject to court scrutiny and may be rendered void if deemed involuntary by the courts, it behooves the examiner to make certain that the rights of the subject in a lie-detector examination are protected insofar as he can. If the examiner does not consider the rights of the subject, the usefulness of the lie detector as an instrument in the detection of deception has been reduced and the status of the examiner as an expert in the interrogation of persons has been impugned.

> A confession in order to be admissible must be free and voluntary. It must not be exacted by any sort of threats or violence, nor obtained by any direct or implied promises, nor by the exertion of any improper influences.[13]

Another facet of this concept concerns the admissibility of a confession obtained prior to legal cause for detention or formal accusation. Since there appears to be no judicial consensus on this point, it would be well for the examiner to familiarize himself with the court decisions of his state.[14]

Also, the examiner must be aware of the two ideas basic to the administration of justice:

1. No one should be *compelled* to accuse or to incriminate himself, and

2. A confession should be rejected when made under *circumstances rendering it unreliable.*

What precautions, then, should the examiner take during the interrogation to insure the rights of the subject?

WHAT ARE THE RIGHTS OF THE SUBJECT?

I. The subject has the right to be examined by a qualified operator.

The POLYGRAPH & INTERROGATION Section Editor invites each reader to make contributions

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[4] New York v. Forte, 18 NE 2d 31 (1938). California v. Porter, 288 P 2d 561 (1955); 222 P 2d 151 (1950). Pennsylvania ex rel Riccio v. Dilworth, 115 A 2d 865 (1955). Jewell v. Arkansas, 251 SW 2d 486 (1952).

[5] Wisconsin v. Perlin, 68 NW 2d 32 (1955).

[6] In Kansas v. Lowry, 185 P 2d 147 (1947), the trial court suggested to the defendant and complaining witness that they submit to lie-detector tests before the second trial. In compliance with the court's request, they submitted to such tests without any stipulation that testimony might be admitted concerning the results of such tests. On appeal, the results of the lie-detector examinations were ruled inadmissible and a new trial granted.

[7] North Dakota v. Pusch, 46 NW 2d 508 (1950). Henderson v. Oklahoma, 230 P 2d 495 (1951). Leeks v. Oklahoma, *op. cit.*

[8] Henderson v. Oklahoma, *op. cit.*

[9] *Ibid.* Leeks v. Oklahoma, *op. cit.*

[10] *Ibid.* See also North Dakota v. Pusch, *op. cit.* Henderson v. Oklahoma, *op. cit.*

[11] Pennsylvania v. Jones, 19 A 2d 389 (1941). Pennsylvania v. Hipple, 3 A 2d 353 (1939).

[12] Leeks v. Oklahoma, *op. cit.*

[13] *Ibid.* See also Illinois v. Lazenby, 85 NE 2d 660 (1949).

[14] Compare Prince v. Texas, 231 SW 2d 419 (1950). Ohio v. Collett, 58 NE 2d 417 (1944). Illinois v. Lazenby, *op. cit.*

It has been brought out in testimony in court that the lie detector as an aid to the investigator, while not infallible, is more accurate than eye-witness testimony; that the examiner requires much experience, absolute integrity, a general knowledge of business and police methods, and very high general qualifications.[15] In other words, the examiner must possess education, training, and experience. In addition, he must have an understanding of and belief in the democratic ideal of the dignity of man.

As you are well aware, there is no such thing as a "lie detector." There is a machine which, when operated by a *trained man*, will help detect deception. The lie detector is a mechanical instrument used as a diagnostic aid. Its validity rests almost wholly upon the competency and integrity of the operator. A comparison may be made to the x-ray which, in and of itself, is rather meaningless without competent interpretation.

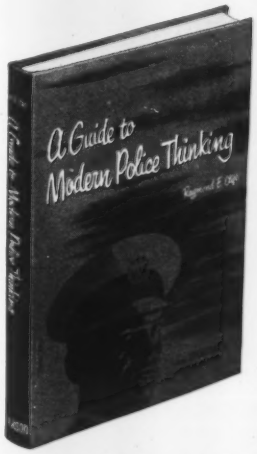
The examiner must understand what impels false admissions of guilt. He also must be aware of the human mind in all its weaknesses, vulnerability, strength and impregnability. He must be aware of what happens to the human mind when subjected to certain situations. He must be aware that what may be physical and/or mental abuse to one person may not be so to another.

It is generally agreed that one of the two greatest sources of error in lie-detector examinations is the unqualified examiner. There is no good reason to condone the unqualified, providing the criteria for qualified examiners can be determined and adherence to these criteria maintained.

[15] MICHIGAN v. DAVIS, 72 NW 2d 269 (1955).

600 B.C. The ordeal of the balance. In India suspects were weighed to determine whether they had told the truth. The suspect sat at one end of a large scale, and a counter-balance at the other end was adjusted carefully. Exact balance was shown by the flow of water in a groove in the cross-beam. The accused then stepped out, listened to a judge deliver an oration to the balance, and got back in. If he were found lighter than before, he was acquitted! (A long sermon should have freed the accused, for metabolic research today shows that the human body undergoes a constant loss of weight.) (From Mulbar, Harold: *Interrogation*. Courtesy of the Police Department of the City of Chicago.)

THE NEW POLICE GUIDE



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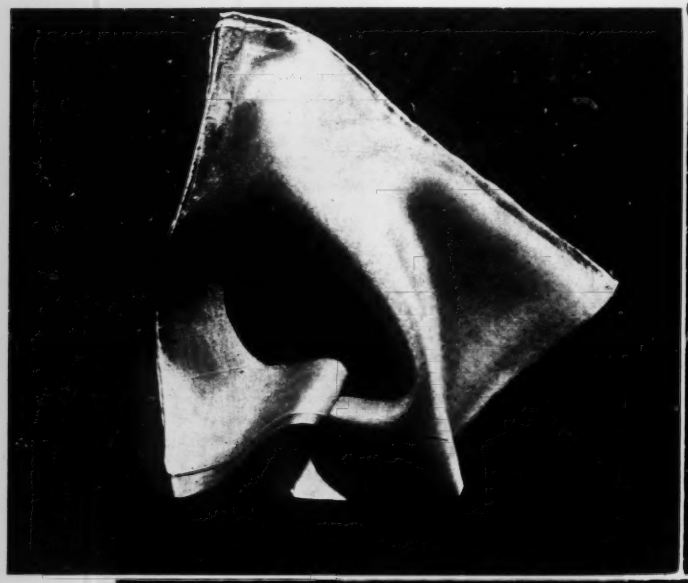
II. The subject has the right to be determined fit for examination.

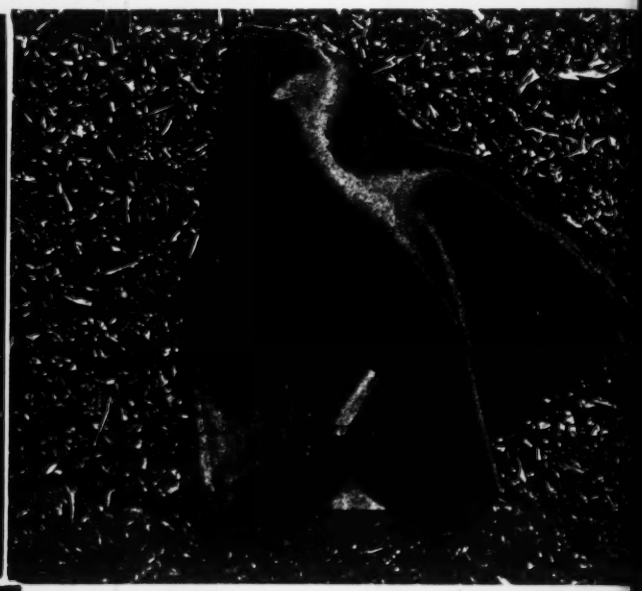
The second greatest source of error in lie-detector examination is the unfit subject. Psychopaths, psychopathic liars, persons suffering from "circumscribed amnesia," persons suffering from cardiovascular dysfunctioning, mental defectives, those who have been incarcerated for a long period, are unfit for lie-detector examination.[16] Some of these the examiner may not recognize until he has worked with them for some time. However, the examiner should be able to recognize as unfit for lie-detector examination those persons who have been subjected to physical abuse or to psychological abuse. The examiner when in doubt should request physical, neurological, or psychological examination of the subject.

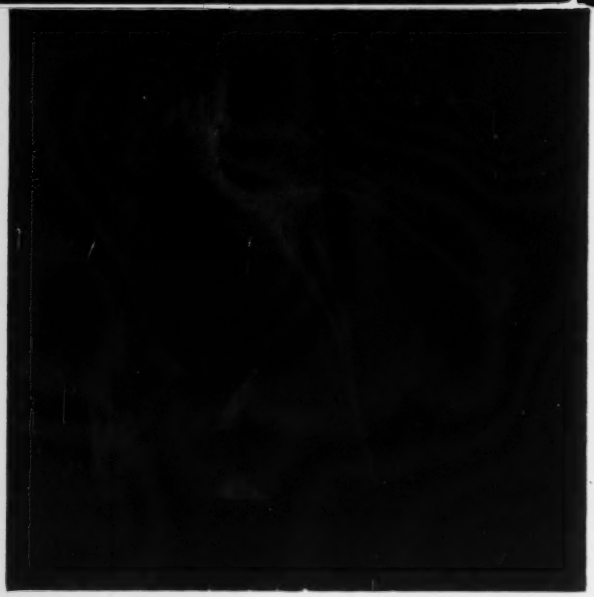
The courts in considering the admissibility into evidence of lie-detector tests have recognized that such factors as—

> mental tension, nervousness, psychological abnormalities, mental abnormalities, unresponsiveness in a lying or guilty

[16] FLOCH, MAURICE: Limitations of the Lie-Detector, *Journal of Criminal Law, Criminology, Police Science, 40*:651-3 (Ja-F 1950).







Photographic Filters Can Mask the True Picture

Film is more sensitive to certain colors than the eye. It is necessary to use filters to obtain an exact reproduction of the gray values in a scene. A filter lightens its own color and darkens everything else. If yellow is photographed against blue, and a yellow filter is used, the yellow becomes lighter and the blue darker. If red is on green and a red filter is used, the red becomes white and the green becomes black. If a green filter is used, the green becomes white, and the red becomes black.

In the upper left figure a red filter was used. In the upper right figure a green filter was used. The lower figure is the normal color exposure of the same subject. (Courtesy, Brooks Institute of Photography. From Houts, Marshall: *From Evidence to Proof.)*

subject account for 25% of the failures in the use of the lie detector.[17]

It has also been noted that there are—

> certain persons having some physiological or psychological abnormalities who would not react as would a normal person to the test.[18]

Many lie-detector errors and inconclusive tests are the result of the acceptance by qualified examiners of subjects who are unfit for any testing because of the treatment to which they have been subjected by the police prior to the lie-detector tests. It appears to be a consensus among examiners that a lie-detection test is most successful if made before extensive accusation of the subject elsewhere.[19] Intensive interrogation based on constant accusations of guilt render a subject unfit for a lie-detector examination as does physical abuse of the subject. A confession obtained as a result of such treatment is inadmissible.[20]

[17] LEEKS v. OKLAHOMA, *op. cit.*

[18] MICHIGAN v. DAVIS, *op. cit.*

[19] See LEVITT, EUGENE E.: Scientific Evaluation of the Lie-Detector. *Iowa Law Review*, 40:440-58 (Spring 1955). INBAU, FRED E.: Some Avoidable Lie-Detector Mistakes. *Journal Criminal Law, Criminology, Police Science*, 40:701-5 (Mr-Ap 1950). TROVILLO, PAUL: What the Lie-Detector Can't Do. *Journal Criminal Law, Criminology, Police Science*, 32:(My-Je 1941).

[20] BRUNER v. COLORADO, 156 P 2d 111 (1945). ILLINOIS v. LETTRICH, *op. cit.* PRINCE v. TEXAS, *op. cit.* Contrast OHIO v. COLLETT, *op. cit.*

III. The subject has the right to be informed of the reason for the lie-detector test.

The subject has a right to know why he is being interrogated. This concept is inherent in our administration of criminal justice and is a reaffirmation of the essential principles of the common law. It may be inferred from Amendment VI to the *Constitution of the United States* which states in part, "In all criminal prosecutions, the accused shall enjoy the right . . . to be informed of the nature and cause of the accusation. . . ."

Informing a subject as to the reason for the lie-detector examination usually occurs prior to the time when the subject meets the operator. It is another of those situations over which the operator has no specific control. However, this point cannot be overlooked in discussing the rights of the subject since the operator and subject could discuss the reason for the examination in the conversation preliminary to the test.

IV. The subject has a right to have an explanation of the lie-detector machine and what it does.

The subject's reaction to the machine may indicate how the interview should be conducted and how the subject should be handled. It assists the examiner in determining the subject's attitude toward the entire test. Such explanation will allay fear of pain and might do away with nervousness.[21]

In a court review of whether a confession was voluntary or not, the explanation of the machine and what it does and the manner in which it was given by the operator would be significant and highly pertinent.[22]

[21] See Reid, John E. and Arthur, Richard O.: Behavior Symptoms of Lie-Detector Subjects, *Journal Criminal Law, Criminology, Police Science*, 44:104-8 (My-Je 1953).

[22] Ohio v. Collett, *op. cit.*

V. The subject has the right to consent to the lie-detector test.

It has been ruled that a person cannot be compelled to take a lie-detector test without his consent.[23] Obtaining answers to questions and recording these answers on the polygraph should be done only after consent is given by the subject. A lie detector employed without consent is being used illegally, even though the apparatus is not in operation when the statements are made.[24] Statements obtained by the use of the lie detector without consent are inadmissible, although they may be substantially the same as other statements made by the defendant to the police.[25]

In the case of Illinois v. Heirens, the court ruled that the unauthorized use of the lie detector is a—

> flagrant violation of rights. . . . If either a confession or a plea of guilty is caused by illegal and coercive conduct on the part of law-enforcement officials, the conviction cannot stand.[26]

The Constitutional privilege against self-incrimination must be observed (Fifth and Fourteenth Amendments).

VI. The subject has the right to refuse to submit to the lie-detector test.

In the case of Minnesota v. Kolander,[27] as grounds for a new trial, the defendant claimed it was an error to permit the state to show he had refused to submit to a lie-detector test. In this case, the state conceded that

[23] Missouri v. Cole, 188 SW 2d 43 (1945).

[24] Illinois v. Sims, 69 NE 336 (1946).

[25] *Ibid.*

[26] Illinois v. Heirens, 122 NE 2d 231 (1954). In this case, however, the pleas were not deemed the product of the illegal conduct of the law-enforcement officials, although the unauthorized use of the lie detector was one of the bases for the appeal.

[27] Minnesota v. Kolander, 52 NW 2d 458 (1952).

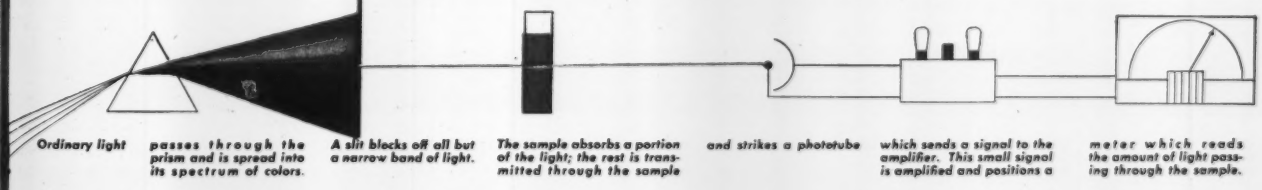
The spectrophotometer utilizes the physical properties of absorption spectra and measures the intensity of light passing through the specimen material. The material is put in a solvent and placed in a test tube. Known wave lengths of light—separated from other wave lengths by a diffraction grating—are then passed through it and the amount of light absorbed is measured. This is computed by assigning a mark of one hundred to a clear test tube and then reducing the gradient numerically by the amount of light stopped or absorbed by the test tube material. As the various wave lengths are measured, a graph is plotted so that a curve develops. This is then compared with known curves, worked out in advance and on file; and a qualitative identification can be made.

For example, a graph worked out on an unknown substance is searched against the file until the strychnine graph is pulled. The two graphs are identical; hence, the unknown substance is identified as strychnine.

The spectrophotometer is employed on organic materials—the carbon compounds. It can be used as an accurate means of determining blood alcohol. Inks, papers, dyes, cosmetics and fibers can all be examined and compared with it.

The spectrophotometer and the spectrograph may be used to supplement each other. The graphs of two specimens of paint may be worked out on the spectrophotometer for their organic components. Specimens from the same sources may then be run on the spectrograph to identify their inorganic elements. If the graphs from the spectrophotometer are identical and the spectrograms the same, then the case for probable common origin is strengthened. (Courtesy, Beckman Instruments, Inc., Fullerton. From Houts, Marshall: *From Evidence to Proof.*)

HOW A SPECTROPHOTOMETER WORKS


Ordinary light passes through the prism and is spread into its spectrum of colors.
A slit blocks off all but a narrow band of light.
The sample absorbs a portion of the light; the rest is transmitted through the sample
and strikes a phototube
which sends a signal to the amplifier. This small signal is amplified and positions a
meter which reads the amount of light passing through the sample.

the results of the lie-detector test would not be admissible, but contended that it could nonetheless be shown that the defendant refused to take the test, "since refusal is evidence of a consciousness of guilt similar to evidence of flight." With this the court did not agree and stated:

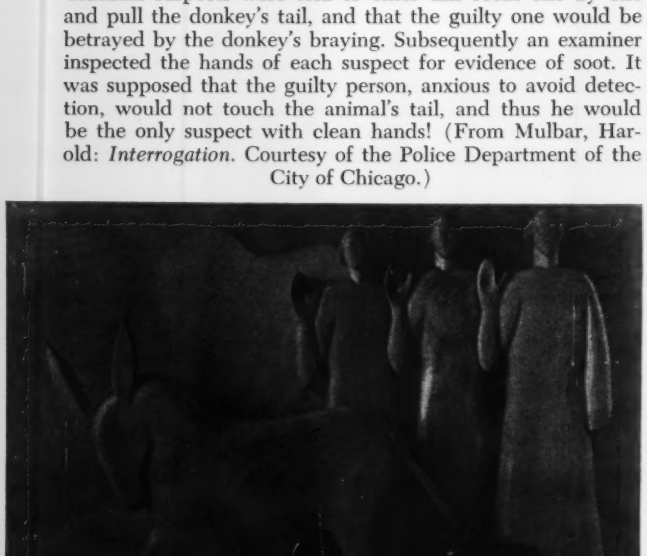
> There was no explanation to the jury of the operation or effect of a lie detector. It was not even shown what type of test the defendant refused to submit to. The impact upon the minds of the jurors of a refusal to submit to something which they might well assume would effectively determine guilt or innocence, under these conditions, might well be more devastating than a disclosure of the results of such test, if given after a proper foundation showing how the apparatus functioned. . . . It was a prejudicial error to permit such refusal of the defendant to submit to a lie-detector test to be shown.[28]

It has been held improper for the prosecution to attempt to rehabilitate the credibility of a complaining witness by asking him on redirect examination if he had voluntarily submitted to a lie-detector test during the investigation of the crime. The court submitted that:

> It was not fair to place the defendants in the entrapped position that required them at their peril either to pursue the inquiry as to the nature of the results of the test or to be damned by the adverse impressions which would be expected to flow from their failure to do so. Practical effect of the admission of the testimony . . . was to allow by inference, the admission of damaging evidence that would not have been equally admissible had it been submitted directly.[29]

[28] *Ibid.*

Pulling a donkey's sooted tail. Ancient India developed a psychological test to determine criminal guilt. A donkey was placed alone in a dimly lit room, its tail covered with soot. Criminal suspects were told to enter this room one by one and pull the donkey's tail, and that the guilty one would be betrayed by the donkey's braying. Subsequently an examiner inspected the hands of each suspect for evidence of soot. It was supposed that the guilty person, anxious to avoid detection, would not touch the animal's tail, and thus he would be the only suspect with clean hands! (From Mulbar, Harold: *Interrogation*. Courtesy of the Police Department of the City of Chicago.)



Testimony in court that a witness had refused to take a lie-detector test has been permitted for impeachment purposes only, because the witness had put facts in issue which could be rebutted only by evidence of the refusal.[30] However, objection has been sustained in court to the question asked of a defendant, "Are you willing to undergo a lie-detector test?"[31]

It would seem that reference during a trial to willingness or unwillingness of the subject to submit to lie-detector examination has been generally held to be prejudicial error.

VII. The subject must not be compelled to undergo prolonged questioning.

A confession is inadmissible as involuntary when the defendant is subjected to a lie-detector test for long periods of time[32] or to several lie-detector tests covering a long period of time.[33]

In considering a case where during a fifteen-hour polygraph session the defendant was called vile names, accused of killing his wife, threatened with violence, given neither food nor rest nor opportunity to answer the call of nature, but repeatedly advised that the inquisition would continue until the defendant gave the examiner what he was after, the court stated:

> Continued and persistent questioning and accusations to the point of exhaustion of a defendant may be just as effectual in obtaining a confession as threats, promises, or physical abuse.[34]

It was noted by the court that prior to the lie-detector examination, the subject had been interrogated by the police for days.

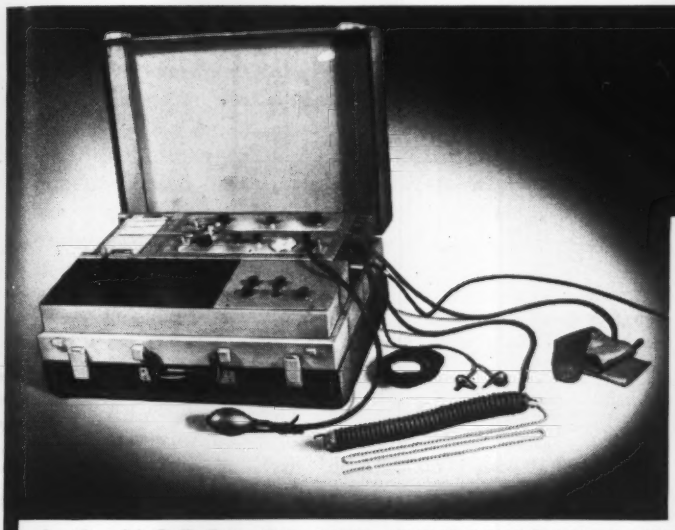
Where confessions were secured after the defendant was held incommunicado for more than sixty hours, had been repeatedly questioned by the police, subjected to four lie-detector tests, and finally questioned continuously for eight hours, the court ruled that if the defendant contends—

> that it was this incessant questioning, threats and fear which caused him to make the statement, he should have been permitted to show all the circumstances surrounding his questioning by (the operator) including the nature and extent of the questioning.[35]

The foregoing statement referred to the ruling of the lower court that questions asked by a lie-detector examiner were inadmissible. The statement indicates that such testimony is admissible where it tends to determine the voluntariness of the confession.

The case of CALIFORNIA v. NEWSON[36] is interesting in

[29] KAMINSKI *et al.* v. FLORIDA, 63 S 2d 339 (1953).
[30] MINNESOTA v. DE ZELER, 41 NW 2d 313 (1950).
[31] CALIFORNIA v. FREDEEN, 224 P 2d 849 (1950).
[32] BRUNER v. COLORADO, *op. cit.*
[33] ILLINOIS v. LETTRICH, *op. cit.*
[34] BRUNER v. COLORADO, *op. cit.*
[35] ILLINOIS v. LETTRICH, *op. cit.*
[36] CALIFORNIA v. NEWSON, 230 P 2d 618 (1951).



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regard to the testimony concerning repudiated confessions which followed as a result of alleged prolonged lie-detector interrogation. Although the admissibility of the testimony of the prosecution's witness was the principal question of the appeal, the evidence concerning the circumstances under which the alleged confessions were made were highly conflicting and the truth and genuineness of them was a major issue before the jury. The defendant maintained that his statements made during the lie-detector test were not confessions and were erroneously admitted as such. Although the court did not rule on the question of the treatment of the statements of the subject during the lie-detector test as confessions, the manner of the conduct of the test was covered and the defendant alleged the lie-detector examiner—

> started questioning over and over and stopped the machine and started it again and started questioning over and over . . . he kept pounding his finger in my face and kept telling me I killed those people and I kept telling him I didn't. . . . After he couldn't get nothing out of me he stopped, and then he started up again and the same thing over and over. . . . Finally he made me mad and I said "All right, I killed somebody, does that make you feel better?" And he turned red in the face and he turned around and shook his head and he walked out the door and after that there was a room full of reporters and different photographers.[37]

It is evident from the cases discussed herein as well as from the testimony quoted above that the examiner must be fully aware of the passage of time and be judicious and temperate in the language he employs as well as his gestures.

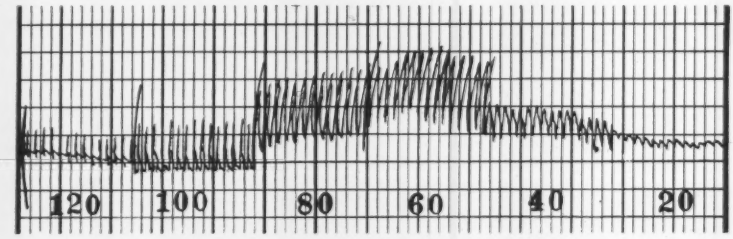
In contrast to a fifteen hour polygraph examination and a series of tests as reported above, in the case of GASWAY v. TEXAS,[38] the court declared:

> While it was brought out by the appellant's counsel that the lie-detector test showed conclusively the appellant was lying, we must view the evidence of the test just as we would any other type of questioning in order to ascertain whether the confession which followed was voluntary. The period of the test covered two hours and fifteen minutes of which time forty-eight minutes was consumed in questioning and the remainder of the time was spent in rest periods between periods of questioning. No pain was shown to have been inflicted upon the appellant, and he cooperated in taking the test. At the conclusion thereof, the party went to lunch. Following lunch, questioning was resumed and fifteen minutes later, the appellant indicated a willingness to confess. . . .
>
> The appellant contends that sixty-three minutes of intermittent questioning should be held to be "long and uninterrupted questioning" which would vitiate the confession which followed. The court does not agree.[39]

[37] *Ibid.* In COBB v. KENTUCKY, 101 SW 2d 418 (1936), the court stated: "A confession voluntarily made by an accused is admissible and even in response to a question, if the questioning is not persisted in to the extent of bringing pressure to bear on the accused to confess in order to escape being plied with questions."

[38] GASWAY v. TEXAS, 248 SW 2d 942 (1952).

[39] GASWAY v. TEXAS, *op. cit.*



Showing the recorded results at different pressure levels—120 mm down to 20 mm. In this case the optimum operating cuff pressure is from 60 to 80 mm, although a satisfactory recording probably could be obtained as low as 40 mm. Produced on a Berkeley Psychograph, which has a wide range of sensitivity. (From Lee, Clarence D.: *The Instrumental Detection of Deception.*)

In CALIFORNIA v. HILLS,[40] it was brought out that the lie-detector test lasted about two hours. Officers were not present, but at intervals were given reports as to its progress. Following the test, Hills told officers he had killed his wife. On appeal, he claimed the confession should not have been admitted into evidence as it was not freely and voluntarily made. The court, on considering the circumstances of the confession along with other factors, denied a rehearing.

The courts tend to judge whether or not an interrogation was prolonged on the facts of each case. The basic rule depends upon consideration of those conditions which might tend to induce the subject to give a false confession in order to terminate the interrogation.

VIII. The subject should not be exposed to oral vilification or abuse.

From the record in the case of WISCONSIN v. DE HART,[41] the court considered evidence that the operator had used profane language in telling the defendant to tell the truth, some of which was denied by the operator. But, said the court, there was "nothing to show that this conversation with the defendant was coercive in manner or content."

The behavior of an examiner who indulges in obscene language or oral vilification or abuse is of no credit to the profession, and it is possible such language under certain circumstances might be deemed at some time coercive, thus vitiating a confession. The deportment, manner, and language of the examiner should be such that it cannot be made grounds for an appeal.[42]

IX. The subject must not be exposed to physical abuse.

Physical abuse as already noted above may include prolonged questioning, lack of rest, lack of food, denial of opportunity to take care of physical needs.[43] There are, however, other factors which may constitute physical abuse. In the case of OHIO v. COLLETT,[44] the court considered that the polygraph room was well-furnished; chairs were comfortable; the room was properly ventilated; the polygraph explained to the defendant; and the occupants of the room could be seen and heard from the outside but the room was not transparent from the inside. In view of all of the above facts, the confession was held voluntary although the defendant had had nothing to eat from breakfast (7:00-8:00 A.M.) until after 7:00 P.M., did not leave the polygraph room during the day, and claimed he was threatened orally by the operator.

Physical abuse then would appear to cover the furnishings of the room, its ventilation, the demeanor of the operator, his language and gestures, as well as the obvious physical needs of the subject.

It has been held that the third degree commonly associated with physical violence—

> also includes conduct which overcomes the prisoner's normal ability to resist, whether accomplished by physical or mental fatigue, fear, threats or promises. The practice of the third degree has . . . resulted in as many improper acquittals as it has improper convictions. The practice of anything that can be characterized as the "third degree" should be so carefully avoided that even to suggest in a court that it has been employed will be recognized as ridiculous and unfounded.[45]

Does the distance traveled to take a lie-detector test have any bearing on the admissibility of the confession that may follow the taking of the test? Would long distances constitute physical abuse?

The fact that a defendant was transported to cities where facilities for lie-detector tests are available does not render a confession, made after return to the jail in the county where the offense occurred, inadmissible as involuntary other things being proper.[46]

The courts though have taken cognizance of the treatment of the subject as to his physical needs on a 173-mile trip to the lie-detector test,[47] as well as the continued questioning of the subject by officers and prosecuting attorneys during a 280 mile trip to a lie-detector test.[48]

[40] CALIFORNIA v. HILLS, 185 P 2d 11 (1947).
[41] WISCONSIN v. DE HART, 8 NW 2d 360 (1943).
[42] See also BRUNER v. COLORADO, *op. cit.*
[43] *Ibid.*
[44] OHIO v. COLLETT, *op. cit.*
[45] *Ibid.*
[46] HENSON v. TEXAS, 266 SW 2d 864 (1954).
[47] OHIO v. COLLETT, *op. cit.*
[48] PRINCE v. TEXAS, *op. cit.* See also LEEKS v. OKLAHOMA, *op. cit.* GASWAY v. TEXAS, *op. cit.*

From this it may be inferred that the physical treatment during the trip as well as the conversations and the demeanor of the officers may be considered important in court as to whether the confession which follows the lie-detector test is voluntary or not. But the operator has no control over the treatment accorded to the subject during the trip. He can, if not employed by a public agency, as an expert refuse to examine a subject who has been mishandled.

X. The subject must not be exposed to mental or psychological abuse.

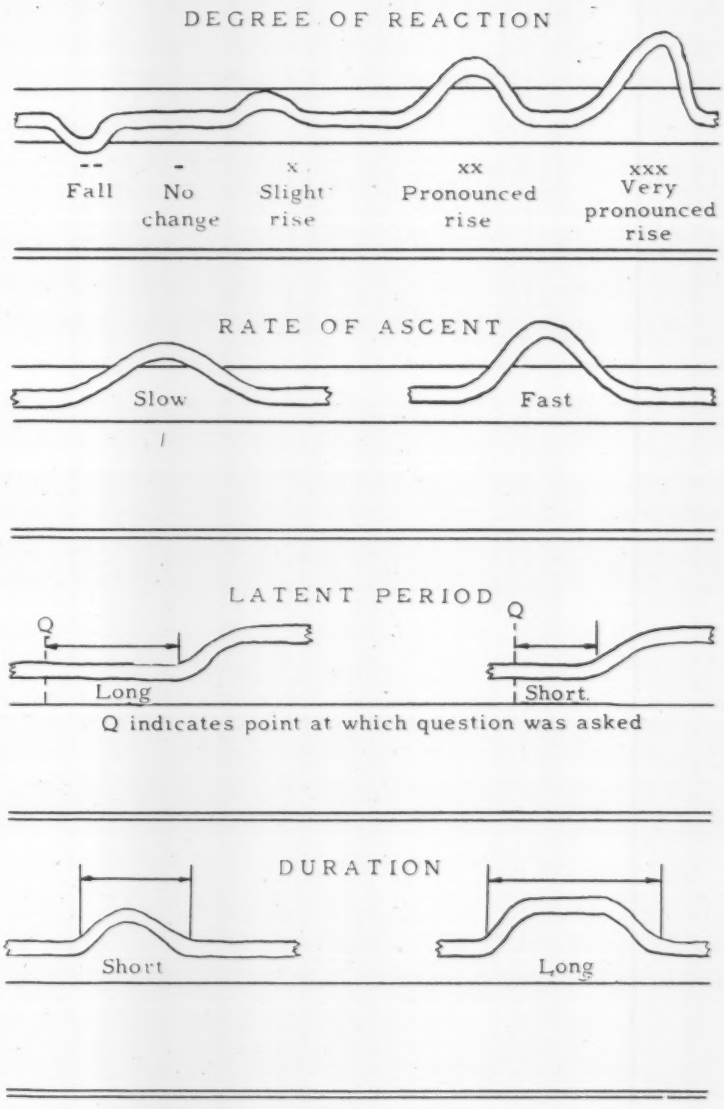
What constitutes psychological abuse?

A statement such as "You can lie to us but you cannot lie to this machine" has been held to be no more than an admonition to tell the truth.[49]

In the case of PINTER v. MISSISSIPPI,[50] it was alleged that prior to the execution of the confession, the defendant had been subjected to influences which "incited him to fear," and that these remained with him when he signed the confession. These fears were aroused while en route to the jail. A member of the arresting party, who was not addressing the defendant, brought into the conversation "the existence of a 'machine that would read your mind' and produce other physiological reactions." When asked what influence this statement made upon him, the defendant testified, "It scared me." In this case the court decided that—

> his fear was not of the machine but of its capacity to elicit the truth. It was therefore a fear of the truth and its consequences. A desire to anticipate by voluntary disclosure the supposed revelations of a "lie-detector" has its origin in the mind and conscience of the defendant and is not an "undue influence."

It is evident that an ignorant person might have superstitious fears concerning the machine, which if played upon, could constitute psychological abuse. It is entirely conceivable that the courts would take cognizance of such approach to obtaining a confession.[51]



Analytical aspects of the blood pressure reaction curve. (From Lee, Clarence D.: *The Instrumental Detection of Deception.*)

There has been a recent civil case on appeal from a court of appeals in which the question was raised of the psychological effects of the lie-detector test on the physical well-being of the subject.[52] In a hit and run accident case, the plaintiff acquiesced to a request of the police to submit to a lie-detector test, although he was informed by his employer's attorney he did not have to do so, but it would aid the position of his employer if there were a claim growing out of the accident. It was claimed in court that, after questioning by the police and after the lie-detector test, the subject was in a highly nervous state, smoked incessantly, was restless, had frequent spells of sobbing and crying which continued until he suffered a stroke and paralysis of his right side. Since he had taken the test to protect the position of his employer, a claim was filed with the Industrial Accident Commission that the stroke and paralysis were incurred in and arose out of his employment. The court took cognizance of the fact that the lie-detector test lasted four minutes; eleven questions were asked, and at its

[49] PENNSYLVANIA v. HIPPLE, 3 A 2d 353 (1939).

[50] PINTER v. MISSISSIPPI, 34 SO 2d 723 (1948).

[51] In McNABB v. U.S., 318 US 332 (1943), the court noted that convictions in federal and state courts, based upon confessions "secured by repeated questioning of ignorant and uneducated persons in whose minds the powers of the officers were greatly magnified" have been set aside on Constitutional grounds. See also PRINCE v. TEXAS, *op. cit.* Whether a confession is voluntary, "it is the duty of the court to determine after careful consideration of the age, situation, and character of the accused and the circumstances under which they are made." MCADORY v. ALABAMA, 62 *Ala* 154 (1879).

[52] TOTH v. STANDARD OIL, 113 NE 2d 81 (1953).

conclusion the policeman operating the machine told the subject the charts indicated he had not told the truth. Since the subject had never suffered from high blood pressure before the police investigation and lie-detector test, an expert witness testified that such an examination probably did cause an increase in the subject's blood pressure and this was the basis of the claim.

According to the court:

> . . . the plaintiff's claim that his disability is an injury caused by the investigation and examination of the police and the use of the lie-detector test is, under the Workmen's Compensation Act, unsupported, and that such disability is not compensable.

The dissenting opinion, however, stated that the injury was incidental to the employment and noted "a medical doctor testified there was a 'direct causal relationship between the claimant's experiences with the police and his subsequent affliction.' "[53]

The case is cited here to call attention to the psychological effects of the lie-detector test and treatment leading up to the test, which in turn may give rise to undesirable physical effects. Of course, the effects would vary with the background, sensitivity, emotional balance, and education of the subject. We all know that the psyche can influence the physical well-being of a person. We all have heard of psychosomatic ailments. Psychological abuse, therefore, can lead to a physical breakdown.

It may be emotionally repugnant for us to accept the idea of the use of the "lie-detector" as a "brainwashing" device. However, if we view the matter coldly we can recognize the possibilities. Consider the facts from the case of ILLINOIS v. LETTRICH, previously cited.

The defendant testified he was advised by a police officer—

> that he would have to submit to a lie-detector test. This officer outlined the crime and then asked the defendant a series of questions. The defendant testified that the test was given to him four times and each time before the questions were asked, the officer related the details of the crime to him; that the officer became angry, "made passes at him," threatened him and told him to admit the crime and get it over with; that he became frightened and finally said, "All right, I did it." The officer then again related the details to him a fifth time before taking a written statement from him at 1:15 A.M. At 3:15 A.M. he was questioned by the State's attorney in the presence of several witnesses and at 5:00 A.M. they took him to the scene to go through a re-enactment of the crime in the presence of 150 spectators, reporters, photographers and police officers. (Reversed and remanded.)

The term "brainwashing" which has become commonplace, could be applied to the procedure quoted above. "Brainwashing," recently called "menticide" (killing the mind), sharpens the internal conflict between reason and emotion; plays on the irrational child lying hidden in the unconscious; hypnotizes us by these means. We see these techniques used in advertising, in political campaigns, in fact, in all propaganda, and on a different level in the lie-detector examination. In the case previously cited, the operator outlined the details of the crime before each of the four lie-detector tests; threatened the subject; told him to admit the crime and get it over with; and then prior to the written statement, the operator related the details of the crime a fifth time. The continued repetition, the threats, the lateness of the hour, all combined to break down the mind of the subject. There was a complete lack of objectivity and scientific integrity in this type of procedure. Such a procedure is alien to the principles of democratic justice.

The dividing line between legitimate interrogation and "brainwashing" can be a very nebulous one. It behooves the competent operator to be well aware of his encroachment into realms of the morally unacceptable.

If the lie-detector examiner is to be accepted as a scientific expert in the interrogation of persons, he must be continually aware of a basic American concept—the dignity of man. His integrity as an objective seeker of the facts within the legal framework of a democratic society must not be prostituted to the attempted verification of foregone conclusions.

The criminalist in the laboratory is not swayed in his examination of an object by a remark such as: "Here's the bullet from the murderer's gun." The criminalist attacks the problem on the basis that here is *a* bullet. Was it fired from a particular weapon? His position as a criminalist is not lessened if he reports that examination indicates it was not fired from the particular weapon. The criminalist's position is not lessened if he refuses to examine an object because it has been improperly handled and preserved or if it is incapable of examination.

The lie-detector examiner in many respects is in the same situation as the criminalist. The "evidence" is brought to him for examination. He usually has no control over it until it reaches his office—and maybe not even then. However, there is one important distinction between the subject of examination by the criminalist and the subject of examination by the lie-detector operator: the subject of examination by the lie-detector operator is a human being.

The subject in a lie-detector examination is a human being entitled to all the consideration any human being is accorded in our society. This is a broad, general statement, and we may or may not agree with it wholeheartedly, but I caution you that failure to abide by this generalization can do no less than bring discredit upon the use of the lie detector and the examiner.

If we are to be regarded as scientific experts, it is our duty to see that subjects are not convicted except by competent and legitimate evidence. We must remember that as representatives of law and justice, we must be fair and impartial. It is not the duty of the examiner to use his technique and skill to obtain a confession which will later be rendered void; it is not the duty of the examiner to lend himself and his machine to the examination of unfit subjects or subjects made unfit by previous treatment. All this brings the profession into

[53] *Ibid.*

disrepute and prolongs the time when the examiner will gain scientific standing. Brutality, oral, physical, and psychological, during the test is no substitute for brains in conducting an examination.

May I conclude by again calling to your attention that the lie detector is an instrument primarily designed to test the credibility of a witness. This is legally the function of the jury. However, the jury can be assisted by expert opinion. But, in order for expert opinion to be admitted, the practice of examination must be above reproach. This means that the qualification of the operator be established, that the condition of the subject at the time of the examination be established, and that the rights of the subject as a human being in a democracy have not been violated.

The basic principles underlying the rights of the subject may be summarized as follows:

1. No person shall be compelled to accuse or to incriminate himself.
2. No person, by his real or alleged action, deprives himself of the rights of a human being.
3. The subject should have voluntarily consented to the examination.
4. The circumstances preceding, during, and subsequent to examination must be such as to preclude the possibility of making the results unreliable.

In view of the court opinions cited in this paper, the following list of positive actions for the polygraph examiner are submitted to the Academy for consideration. This list is based on court opinions, implied or explicit, and, if followed, will not only insure the rights of the subject, but will enhance the status of the examiner.

DO's for lie-detector examiners:

1. Make certain the machine is in perfect operating condition.
2. Check that interrogation room is
   a. well-ventilated
   b. properly lighted
   c. comfortably arranged
   d. soundproof
   e. free from interruptions
   f. free from distractions within the room such as gaudy pictures or anything which may take subject's attention away from the test.
3. Provide for one way screen for witnesses to see and hear (through reproducer) the examination.
4. Provide for recording of entire examination.
5. Allow no one in room except subject.
6. Ascertain subject is fit for examination.
7. Obtain subject's consent.
8. Have subject read and sign a "statement of release" worked out jointly with local bar association.
9. Explain to subject the operation of the machine and the various parts that will be attached to him.
10. Keep subject attached to machine only during interrogation.
11. Release subject from apparatus after each run.
12. Allow opportunity for subject to take care of his physical needs: food, water, elimination.
13. Ascertain all available information about the case before interrogation.
14. Ascertain all available information about the subject before interrogation.
15. Allow subject opportunity to talk.
16. Be a good listener.
17. Prepare questions carefully to avoid information about the case generally known.
18. Keep number of questions for any one run to a minimum.
19. Be polite, detached, considerate.
20. Avoid making statements which can be interpreted as promises.
21. Avoid language which may be interpreted as threatening.
22. Avoid gestures which may be interpreted as menacing.
23. Control your temper.
24. Avoid showing prejudice or bias.
25. Observe the passage of time so as not to prolong the interrogation.

CASES CITED

The list of cases cited and discussed were selected from among the many cases pertaining to the lie detector, as they seemed to be particularly pertinent to this paper.

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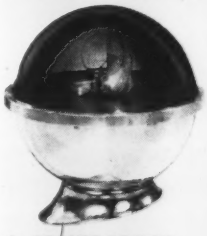

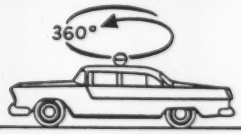

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The American Bar Foundation Survey of the Administration of Criminal Justice*

EDITOR'S NOTE: *The American Bar Foundation of the American Bar Association has launched a survey of the administration of criminal justice in the United States on an unprecedented scale. Nothing of its size and scope has been attempted before. Neither before nor since the National Commission on Law Observance and Enforcement was appointed by President Hoover and began its work in 1929 (culminating in the noted Wickersham Reports) has there been launched a more significant undertaking in the field of criminal justice administration.*

The Survey recognizes at the outset the strategic role of police administration in the total picture and intensive research attention will be directed to problems that inhibit the more rapid development of a professional caliber of police service. These will include the restrictions imposed on law enforcement which, rather than preserving a reasonable balance between the preservation of individual liberty and the interest of society in protecting itself from the depredations of crime, weight the scales in favor of the criminal—and other conditions, including inadequate pay, lack of opportunities for training, and insecurity of tenure, all of which have an obviously depressing effect upon the efficiency of any police organization.

Every police administrator in the United States and his command personnel at least, should read the following study of this operation which is already under way so that they may give to field research teams the best possible cooperation.

DURING 1953, the Special Committee on the Administration of Criminal Justice of the American Bar Association commenced the task of preparing plans for a research and study project that holds the promise of becoming one of the most significant and far-reaching activities ever undertaken by the organized bar. Described as a survey of the administration of criminal justice in the United States, the project contemplates a study of the actual operations of the system of criminal justice in representative state and federal jurisdictions throughout the nation.

This is not legal research in the sense in which the term is ordinarily understood by lawyers. Rather, it is research directed towards an examination of the law in action in the field of criminal justice. As such, it will extend beyond a study of codes and statutes, beyond judicial decisions or the compilation of statistics. It will include these things, of course, but primarily the project will rest upon study and examination of the institutions of criminal justice in operation, their inter-relationships and the part played in them by public officers, members of the bar, the judiciary and those charged with the responsibility of dealing with the convicted offender.

Of these institutions none is more important nor faced with more serious problems than the police systems of the United States. It is upon the police of both state and federal jurisdictions that the whole processes of law enforcement depend and in whose hands rests the primary responsibility of preserving law and order in circumstances which all too often carry great personal hazards and a tremendous measure of personal sacrifice. In carrying the burden of preserving a free society against its lawless members the police organizations of this country have been burdened by an infinite variety of restrictions, the combined interference of the well-intentioned but impractical with those who seek to subvert order, and the task of combatting large criminal enterprises on the most uneven terms. This has posed a continuing challenge little understood and less appreciated by the public.

Under our form of government the concept of limited police authority is inherent. It is essential to the preservation of individual rights and a decent society. Too frequently, however, the restrictions imposed on law enforcement, rather than preserving a reasonable balance between the preservation of individual liberty and the interest of society in protecting itself from the depredations of crime, weight the scales in favor of the criminal.

Beyond this issue, however, which is an area that has been marked by more controversy than good sense, there are other conditions which affect the police where correction and improvement are subject to little, if any, question. These are the conditions of inadequate pay, lack of opportunities for training, and insecurity of tenure, all of which have an obviously depressing effect upon the efficiency of any police organization. There has been great progress in this field, progress that has come hand in hand with the growth of the idea that police service should and ultimately must be regarded as a profession. Most of this progress, however, has not come from the interested efforts of the public but rather from the police themselves. Through the International Association of Chiefs of Police and the many other associations of peace officers found throughout the land has come most of the stimulus for the development of everything from modern crime detection techniques to civil service systems which make it possible for a police officer to serve his community free of those influences which often make it impossible for him to enforce the law.

* An official news release based upon an address by Honorable Warren Olney III, Assistant Attorney General of the United States, delivered before a recent annual convention of the International Association of Chiefs of Police.

If we assume that wide and interested public understanding of these problems will lead to their solution, anything that can focus the attention of our citizens upon them and enlist their support for the correction of the deficiencies, which are criticized more often than they are removed, will serve the best interests of law enforcement. It is to this end that the survey of the administration of criminal justice by the American Bar Foundation will be directed.

Preliminary plans for the survey are now complete. Through the generosity of the Ford Foundation, which provided the funds for the planning period, an additional grant has been made to the American Bar Foundation for the purpose of establishing a research staff which will launch the first field operations. Of necessity, the initial effort will be something of a pilot project conducted on a relatively small scale, through which the research organization will test its methods and acquire the administrative experience that are necessary prerequisites for the conduct of any endeavor of this nature. In a very small sense, too, the survey project is an experiment; nothing of its size and scope has been attempted before.

At this point, something should be said of the reasons which prompted the American Bar Association to undertake a work of such magnitude. Basically, these were stated by the late Justice Robert H. Jackson, first chairman of the Special Committee on the Administration of Criminal Justice, in the following words:

> Our criminal procedure, as exhibited in many of our most publicized trials, is not creditable to our people or to our profession, and in less noticed day-to-day routine operation it is even less so. There is widespread doubt that existing criminal procedures can be relied upon either adequately to protect society, or to protect the individual accused. Meanwhile, public opinion of both Bar and Bench is formed upon what is seen of criminal trials on which its interest is focused by sensational publicity, while the marked improvements that have been made in civil procedures make little impression. Although nearly everyone agrees that our law-enforcement process is sadly deficient, there is no such general agreement as to just how it really is working and when and why it fails. Attempts to answer these questions have produced some useful crime studies, but most of them have been either local, limited to a specific class of offenses, or designed to support predetermined programs of reform.

It is not enough to say that public attitudes arise from misapprehensions, as many of them do; it is no answer to attempt to shift the burden by criticizing the police, the courts, the press or the administrators of our prison systems. It is necessary, rather, to respond to the challenge by a serious and coordinated nationwide effort to search for the causes of the deficiencies we deplore, to evaluate both the strength and the weakness of our system of criminal justice and to propose effective and practical remedies where it is apparent they are required. These are the objectives of the survey project.

At the outset, the Special Committee thought it desirable to fix the boundaries of the field of inquiry. As a starting point, it selected the commission of criminal offenses.

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From this beginning it recommended that the study proceed to follow the ensuing processes as they are administered by the police, prosecuting officials and courts to the point of final determination, including probation, sentence and parole. Crime causation and prevention, motor vehicle traffic offenses and substantive criminal law problems were excluded primarily to keep work within manageable bounds, but also because research in these fields is more appropriate for disciplines other than the law and because it would duplicate the work of other groups and professional organizations like, for example, the model penal code project currently being undertaken by the American Law Institute. Within these limits, and extending to both state and federal jurisdictions, the area for study has been blocked out in four main divisions: the police function, the prosecution and defense of criminal actions, the criminal courts, and probation, sentence and parole.

Within the first of these divisions, it is planned to conduct a study of police systems in the United States, their administration, their functions and their problems. As in each of the other three fields of research, it is proposed to study the police function not only as such but, in addition, with respect to its inter-relationships with the others. In this respect, the plan for the survey enters new ground not subject to much previous exploration. To the Special Committee this is considered essential since a significant amount of police practice and procedure is

directly influenced by the practices and procedures of the prosecutor's office and by the courts. All of the institutions of criminal justice, in fact, interact, one upon the other so that no one of them, even though they are administratively independent, can be observed understandingly without consideration of the effects of this interaction.

The prosecution and defense of criminal actions is a field of inquiry bearing most closely upon the interest and the responsibility of the bar. Study in this field will embrace not only the office of the prosecuting official and the procedures of criminal trial practice but also the function of the defense attorney, the office of public defender and the voluntary defender system. It should be noted here that there are few other places, if any, in the administration of criminal justice where lack of public understanding is more critical than it is with respect to the functions and the obligations of counsel for the defense. The proposed survey may well be an effective means through which this attitude may be corrected and respect stimulated for the constitutional right to representation by effective counsel.

Study in the field of the criminal courts will include procedures, particularly appellate procedures and the increasingly troublesome overlapping of federal and state jurisdictions in the employment of extraordinary writs. It will also embrace examination of the grand jury and its functions, the selection and qualification of trial jurors and whatever judicial processes bear upon the system of criminal justice, including those which affect the other institutions and agencies which take part in its administration.

The last division—probation, sentence and parole—was included by the Special Committee within the scope of the survey not with any desire to explore the techniques and practices of custodial or probationary treatment but rather because the legal and administrative procedures in this field cannot be overlooked without running the risk of having the survey produce incomplete or distorted results. The offense with which an offender may be charged by a district attorney, for example, may be influenced directly by the sentence he knows will follow conviction, by the probable disposition of the convicted defendant under the prevailing parole system or by his eligibility for probation. Similar considerations influence the judge when he approaches the problem of disposition of the convicted offender. Experience may indicate that study of this subject should be on a broader basis. If so, there is no reason to doubt that the research organization can call upon professional parole and probation societies and organizations, upon penologists and other qualified persons in this field for assistance and guidance to the end that the product of the survey will possess the accuracy and the reliability which its objectives demand.

The survey plan calls for the establishment of a research organization for the conduct of its operations. Basically, the staff will consist of a headquarters group and field research teams. The direction of the project will be the responsibility of four consultants, one for each of the four principal divisions of the survey and each one a competent, professional expert in his field. They will be assisted by a director of field research, who will be responsible for the supervision of teams of field researchers who will perform on-the-ground studies of the processes of the criminal law in action. Like the headquarters personnel, the field researchers will be selected for their

competence and experience in one or more of the principal divisions of research. It is not expected, for example, that a police department will be studied by an individual who does not have a solid grounding in police work and police administration, nor that a survey of criminal trial practice will be entrusted to a lawyer who has never borne the burden of preparing and trying a case.

This is one of the basic principles which will govern the conduct of the survey—the principle that inquiries and studies in the field of the administration of criminal justice can best be done by those who have had some firsthand experience with the subject matter. As a result the project is not to be an inquiry conducted by the legal profession alone but a study, rather, which will endeavor to bring together all of those who are concerned in the administration of the system. Characteristically, most prior studies have been limited to the police alone or to the courts or to other single aspects of the administration of criminal justice without a proper regard for their mutual interdependence and their influences upon each other. The police department bears a very intimate relationship with the office of the prosecutor. To evaluate the performance of a police organization without endeavoring to determine how it is influenced by the concurrent and sometimes conflicting activities of the prosecutor is to produce a picture which is out of focus and which can lead to more misunderstanding than no study at all.

The reports of the field research teams will be the raw material produced by the survey. After these reports have been collated, supplemented with necessary legal research and organized into studies and reports by the headquarters staff, they will be prepared for publication so that the information and data collected may be given the widest dissemination to bar association, professional societies, legal scholars and all interested groups and persons. As a final step, the Special Committee will publish a report or series of reports which will contain its findings and the recommendations which will embrace its conclusions as to the remedial measures which ought to be undertaken throughout the nation to repair the defects which the study will have disclosed and to strengthen and maintain the positive values basic to the American system of criminal justice.

Although the most striking characteristic of the proposed survey is its emphasis upon what have been called field research procedures which have been designed to discover and to report accurately the significant facts about the practices and procedures of the institutions and officers who apply the processes of the criminal law, the survey will rest upon a broader base. It will seek, for example, to enlist the assistance and the participation of professional groups having interests in each of its four main fields; it will invite particularly the cooperation of bar associations, of law enforcement organizations, of judicial conferences, of public officers and of representative groups of laymen who are active or interested in the problems of criminal justice.

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Such cooperation and participation will have a twofold purpose: first, to make available to the research staff the product of the great amount of investigation and study that has been undertaken in this field throughout the nation in order to avoid duplication of effort and to assign to qualified groups and individuals local or specialized studies and research activities for which they may be specially qualified; and, second, to gain the advantage of the experience, the techniques and the knowledge of those whose professional and practical skills are being employed in the administration of the system.

In order to achieve this result, the research staff will carry out a liaison program through which it will endeavor to reach all of those whose assistance will be needed. Of fundamental importance here in the opinion of the Special Committee is the necessity for making it unmistakably plain that the project is in no way planned as a fault finding expedition; it is not designed to provoke controversy, to assess blame or to generate public scandals. It is organized, rather, to conduct an objective, impartial inquiry and study in its field of research, in which all groups and the public as a whole may join, confident that this endeavor is devoted not only to the discovery and correction of weaknesses but also to the preservation and the support of that which is good.

Unfortunately, many of the investigations, studies and inquiries made in the past of the institutions and organizations charged with the administration of the system of

criminal justice have tended to describe this function of government in terms of its defects. Little attention has been given to its virtues. This has resulted in reform it is true, but at the same time there can be no doubt that it has led to the formulation of public and professional attitudes reflecting skepticism and lack of confidence in public justice which it has not entirely deserved. It is the view of the Special Committee on the Administration of Criminal Justice that the broad and impersonal factual study contemplated by the research project should produce a more balanced result and that to achieve this objective it must look to the assets as well as to the liabilities of the system.

It has already been noted that the survey will be conducted in both state and federal jurisdictions. Obviously, however, it cannot be conducted in every county in every state nor in every federal district. Of necessity, representative states and representative jurisdictions within the states, as well as within the federal system, must be chosen pursuant to criteria which may be counted on to yield a valid sample of the whole. Thus far, such selection has been tentative both as to the limited area in which the survey's pilot project will be initiated and as to the jurisdictions which will make up the total of the places in which the program will be operated. After long consideration by the Special Committee it seemed most desirable to commit the problem of recommending the choice of jurisdictions to the research staff, subject to final approval by the Committee. With respect to the pilot project, this has in part been accomplished.

The State of Wisconsin was selected as the first jurisdiction within which field studies would be initiated. The survey staff selected Wisconsin because of its nearness to the American Bar Center at Chicago, from which the project is being administered, and because the geographic area of that state and the system of criminal justice there will not interpose the administrative problems which will inevitably confront the survey in jurisdictions containing large and complex metropolitan areas. At the beginning of the work it will be necessary to test the methods to be used with the greatest care, to train field research personnel, and to acquire the operating experience which will be necessary to expand the survey to a nationwide effort.

Those who have been selected to bear the responsibility for the direction and operation of the survey are:

The project director, who has been identified with the survey since its inception, is Arthur H. Sherry, now Professor of Law and Criminology at the University of California, formerly Chief Assistant Attorney General of California and, prior to that, Chief of the Criminal Section in the District Attorney's office at Alameda County.

The Consultant in Police Administration is well known. He is O. W. Wilson, Dean of the School of Criminology at the University of California, formerly Chief of Police at Wichita, Kansas, and noted police administrator, author and consultant.

Fred E. Inbau, Professor of Law at Northwestern University where he now conducts an annual institute for prosecuting attorneys, is the Consultant in Prosecution and Defense. Professor Inbau was the former Director of the Chicago Police Scientific Crime Laboratory and is well known for his outstanding work in the field of criminal law during the past thirty years.

The consultant in the Criminal Courts is Benjamin E. Matthews of New York. Mr. Matthews, a practicing at-

New York City—The Grand Drive on St. Nicholas Avenue. A mounted police patrol at 126th Street pursuing a fast driving team (Bettmann Archive).

ATR Inverter

An ingenious ATR Inverter turns any auto into a "Rolling Office" for operating standard Tape Recorders.

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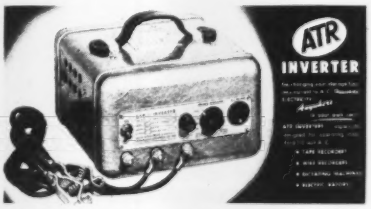
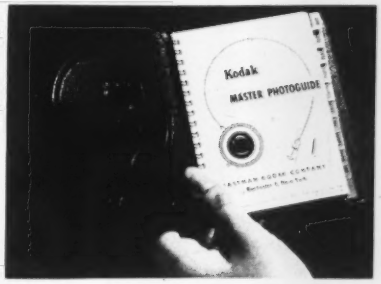


The ATR Tape Recorder Inverter operates from the 6 or 12-volt DC automotive storage battery system and provides 110 volts AC household electricity for operating the recorder.

The Inverter is available with mounting brackets for under-dash or trunk mounting. A remote control unit is available for use with Inverter, when Inverter is mounted in trunk compartment.

Complete literature is available direct from the manufacturer, American Television and Radio Co., 300 E. 4th Street, St. Paul, Minnesota.

Complete Revision of Kodak Master Photoguide Includes All Data on Latest Films



A new edition of the popular Kodak Master Photoguide with complete information on all the latest Kodak films is available. Retained in the new edition are all the features which have made the sturdy, 32-page, pocket-size booklet a valuable tool which provides on-the-spot picture-taking information for still pictures in black-and-white and color on miniature, roll, pack and sheet films.

High Powered Portable Loudspeaker Developed

Sound-Craft Systems of Pittsburgh, Pa., manufacturers of Portapage portable loudspeakers, have announced the addition of two new models to their line of portable systems. The new Big-Voice models use a transformer-coupled amplifier powered with heavy duty batteries. The amplifier and batteries are enclosed in a rust and corrosion proof case. A molded bakelite, noise cancelling microphone is equipped with a lock down type talk switch for either intermittent or continuous duty.

The manufacturer states that the Big-Voice models have an effective range up to ½ mile. They were developed to fill the requirements of police, firemen, civil defense units and others that require high volume sound output in heavy traffic, fire areas or at the scene of a disaster.

The illustration shows a Model IB8-BV Big-Voice mounted on a Model CW window bracket. With this accessory any car or truck can be converted to an emergency sound vehicle in a matter of seconds.

Additional information can be obtained from Sound-Craft Systems, 661 Rochester Road, Pittsburgh 2, Pa.

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torney, is a former Special Assistant Attorney General and former Chief Counsel for the New York Crime Commission.

Sanford Bates, recently retired Commissioner of Institutions and Agencies of the State of New Jersey and a former Director of Federal Prisons, serves as the Consultant in Probation, Sentence and Parole.

After the announcement was made that the survey would be commenced in Wisconsin, an editorial was published in *The Milwaukee Journal* which accurately sums up the spirit and purposes which underlie the decision of the American Bar Foundation to undertake this great task. That editorial said:

> People with titillating memories of the Kefauver crime committee hearings need not expect a repeat performance. That committee's work did hasten this project; it dramatized some of the big chinks in the armor of law enforcement. But it merely pointed up, by contrast, the need for what this will be—drudging, unglamorous marshaling of all the facts with purely scientific intent and method. That will take, not a few weeks on TV, but five years hard digging in the field.
>
> The study will not praise, criticize or spell out remedies. It has no axes to grind, no premises except that there is obviously great room for improvement and great lack of knowledge as a sound basis for improvement. It will simply establish the data for future use and guidance of lawyers, lawmakers, officials and the public.

It is not possible, within the limits of this report, to do more than sketch the principal outlines of the survey project nor to touch upon all of the manifold complexities involved in planning and carrying into execution a project so broadly conceived. The research organization that must be established to place it in operation will face problems whose proportions, large as they are, may increase instead of diminish as the work goes forward. But the subject of inquiry is so vast that it can be treated in no other way if progress toward the main objective—the improvement of criminal justice in the United States—is to be achieved. The risks are great, the burden of responsibility is heavy but the opportunity for the local profession in the fulfillment of this task to make a lasting contribution to the public good and toward the realization of professional ideals provides us with the incentive to press forward regardless of the difficulties.

The Moral Health of the Nation

EDITOR'S NOTE: *Confirming preliminary estimates, the Federal Bureau of Investigation revealed through the release of its* Annual Uniform Crime Reports *there was a slight decline in major crimes in the United States in 1955, the first reduction in eight years. However, FBI Director J. Edgar Hoover described the decrease amounting to two-tenths of one per cent as "almost negligible when viewed in the light of the fact that this is the fourth consecutive year that the estimated number of crimes exceeded the 2,000,000 mark." The score card that follows will prove of interest not only to police personnel, but to ministers, lawyers, members of civic organizations and all others throughout the country who recognize their responsibility in terms of youth welfare.*

Trend

Major crimes numbered 2,262,450 in 1955, the fourth consecutive year above the 2-million mark. The 1955 estimate is two-tenths of 1% below the 2,267,250 such crimes estimated for 1954.

The slight change marks the first decrease in eight years of comparable crime totals. Percentage increases since 1947 have ranged from 1.3 to 8.2. Thus, the negligible decrease in 1955 still leaves the total 18.7% above the 1947-54 eight-year annual average of 1,906,260.

No change occurred in the murder class. The downward trend in three individual classes ranged from 0.9% to 14.7%. A sharp decrease of 14.7% in robberies was accompanied by a moderate decrease of 5.1% in burglaries. Aggravated assaults (other than rapes) declined only slightly, 0.9%. The spread in percentage changes in the four classes showing increases was not so marked, from 1.5 to 5.9. Percentage increases from high to low are: rape, 5.9; auto theft, 5.2; negligent manslaughter (mostly traffic deaths), 3.7; and larceny, 1.5.

Population and Crime

Population has increased 9% and crime has increased 26% since 1950—the percentage increase in crime is almost three times that of population. Measuring crimes against units of population, the 1955 crime rate is 15.9% above the 1950 rate. (Crimes per 100,000 inhabitants in 1950 numbered 1,187.8 as compared with 1,377.2 in 1955; the 1950 population count was used for the 1950 rate and the population estimate for July 1, 1955, for the 1955 rate.)

Crimes Against the Person

There were 124,300 criminal attacks on persons in 1955, or 470 more slain, maimed or violated than in 1954 —a percentage increase of 0.4. Crimes against the person are: murder and nonnegligent manslaughter, negligent manslaughter, rape, and aggravated assault.

Criminal homicide consists of wilful and negligent killings which are treated separately in tabulations in this program. With (a) murder and nonnegligent manslaughter and (b) manslaughter by negligence grouped, the total persons who died in 1955 at the hands of killers is 12,460 or 200 (1.6%) more than the 12,260 persons killed in 1954 by criminal acts.

The 6,850 wilful killings (murder and nonnegligent manslaughter) in 1955 equaled the number in 1954, while killings by persons acting in a grossly negligent manner (manslaughter by negligence) numbered 5,610 in 1955 or 3.7% above the 5,410 in 1954. Most of these negligent manslaughters are traffic fatalities but do not include all traffic deaths.

Rapes increased 5.9%, the highest percentage increase recorded in any major crime class in 1955. The 19,100 rapes in 1955 were 1,070 or 5.9% greater than the 1954 figure. An analysis by 433 cities shows that forcible rapes increased 21.3% and statutory offenses declined 4.6%.

Aggravated assaults numbered 92,740 or 800 (0.9%) fewer persons shot, stabbed, or otherwise feloniously assaulted than in 1954 (rapes are not included).

Crimes Against Property

These decreased 0.2% in 1955. Loss to robberies, burglaries, auto thefts and other larcenies was about $399 million and about 57% of this amount was recovered, assuming that the national experience was similar to the average for over 400 cities.

Robberies, down 14.7%, still cost about $14 million or about the same as in 1954. This is due to an increase in the average loss per robbery of $246 in 1955 as compared with $219 in 1954. The 57,490 armed and unarmed robberies in 1955 were 9,930 less than the 67,420 in 1954. In 433 cities, all types of robberies, except bank robberies, decreased and this may be indicative of the robbery experience nationally.

Burglaries decreased 26,660 or 5.1% in 1955. The average loss per burglary was $175, a dollar less than the 1954 figure. The loss to burglars was about $86 million in 1955, $5 million less than 1954.

Larcenies (except autos) increased 1.5% and at an average loss per offense of $70 the 1,360,980 larcenies in 1955 involved property valued at about $95 million.

Autos valued at about $203 million were stolen in 1955. However, the high recovery rate for autos, about 92% of the number stolen, cuts the unrecovered loss to a comparatively small figure. The 227,150 auto thefts in 1955 were 11,210 or 5.2% more than the 1954 estimate.

Urban Crime Trends

City crime decreased slightly, 0.8%. Crimes in the biggest cities caused it. They were down 4.3% (Group I—over 250,000 inhabitants). Their smaller neighbors were up 2.9% in 1955.

The increase was about the same in the five city groups below Group I. The smallest increase, 2.0%, was in Group V (10,000-25,000 inhabitants). The largest increase, 3.7%, was in Group VI (under 10,000).

The trend was the same in each city group for four crimes: rape, robbery, burglary, and auto theft. Robbery and burglary were down. Rape and auto theft were up.

Robbery declined the most in the largest cities (Group I), 18.3%. The smallest cities had the second greatest decrease in robberies, 16.9%. Those are the "cities" under 10,000 (Group VI).

Burglaries decreased 9.2% in the Group I cities. They were down from 1.3% to 3.7% in other city groups.

Increases in rape ranged from 2.2% to 11.9%. The smallest city group had the largest increase.

Auto thefts rose from 0.5% to 9.4%. Group II cities (100,000 to 250,000) led the auto theft increases.

Larcenies increased (up to 8.0%) in cities of all sizes except the largest. Group I had a 2.3% decline.

Murders rose from 0.9% to 3.6% in three city groups above 50,000 inhabitants. They declined from 6.0% to 20.7% in the three city groups under 50,000 inhabitants.

A pattern for city trends is not so clear for manslaughter by negligence and aggravated assault. Group I had a 5.2% decrease in manslaughter by negligence, but Group II had a 23.3% increase. The smallest city group had an 11.1% decrease in negligent killings. Other changes ranged from a minus 2.1% to plus 8.5%. Aggravated assaults changed erratically. From a decrease of 8.5% in the smallest city group, the changes ranged to a plus 13.4% increase in Group II (100,000-250,000).

Reports from the same cities for both years were used. If reports are incomplete for either period, they are not used in trend information.

Cities by Location

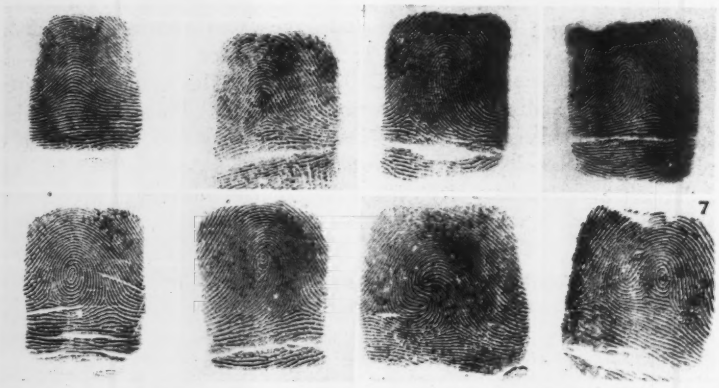
We saw that cities with more than 250,000 population held the trend to the slight decrease. The over-all decrease can be further pinpointed in a geographic grouping of these cities.

City crime increased in all geographic divisions but two. A decrease of 6.2% for the Middle Atlantic and East North Central States overrode the 3.4% increase in other geographic divisions as a group.

The sharpest decrease, 7.8%, occurred in the Middle Atlantic States. The East North Central States followed with a 4.7% decline. Other groups of States had increases, from 0.1% in the West North Central to 5.8% in the East South Central and also the Mountain States.

Pictures can be made to lie—

Are these three men of equal height? See page 66 for the answer. (Courtesy, Brooks Institute of Photography. From Houts, Marshall: *From Evidence to Proof.*)



Did your know

All fingerprints may be classified in one of eight pattern types which are, top—left to right: plain arch, tented arch, right slant loop, left slant loop; bottom—left to right: plain whorl, central pocket loop, double loop, accidental. (From Scott, Walter R.: *Fingerprint Mechanics.*)

Murder decreased in all but two divisions. The 3.8% increase in the West North Central and the 6.9% increase in the East North Central States were accompanied by decreases from 0.8% to 10.2% in other divisions. Other criminal homicides, manslaughter by negligence, were up in all divisions except the Middle and South Atlantic.

Rape decreased in four and increased in five of the geographic divisions.

Six divisions had decreases in robbery while three showed increases. The largest decrease was 28.4% (Middle Atlantic) and the largest increase was 10.5 (New England).

Aggravated assault rose in five divisions with a high of 27.9% in New England. In the four divisions with decreases, the South Atlantic States registered the greatest decline, 8.2%.

Burglary decreased from 2.5% to 13.8% in five geographic divisions while it increased from 1.0% to 2.0% in four.

Larceny increased from 3.4% to 8.5% in seven divisions and declined 3.7% and 4.4% in the other two.

Auto theft increased from 3.4% to 22.8% in seven divisions with the East South Central States high. The Middle Atlantic) and the largest increase was 10.5% (New 0.8% and 5.3%, respectively.

Long-Term Urban Trends

Major crime is 44.4% (1955) above the pre-World War II level in 355 cities. The annual average for the war years (1942-45) was 2.8% above the prewar annual average (1937-39). The annual average for the postwar years (1946-55) is 26.8% above the prewar average.

Population Changes: Population counts are available for the 355 cities used for only two years of study, 1940 and 1950. Population increased 16.8% and crime increased 11.8% from 1940 to 1950 in the 355 cities studied.

Crimes per 100,000 inhabitants (the crime rate) in these 355 cities declined 4.3% from 1940 to 1950. The rate of crimes against the person increased 29.5% while crimes against property decreased 5.7% in the same period. However, note that from 1940 to 1950 crime increased only 11.8% while a 20.8% rise has occurred since 1950.

Rural Crime Trends

Rural crime increased 1.8% in 1955. This is the first levelling off for crime in areas outside cities since 1943. For eleven years the rise has been unbroken with percentage increases ranging from 4.0 to 14.1. Since 1951, the annual increases have been above 8%.

Although rural crime increased 1.8% and urban crime decreased a slight 0.8%, trends for the two areas were similar in all individual crime classes except murder. Rural murders increased 3.1% (city murders declined 1.7%).

Other rural increases were: negligent manslaughter, 7.5%; rape, 4.7%; larceny, 5.5%; and auto theft, 5.5%. (Urban crimes increased in these classes also.)

Robbery decreased sharply, 12%, in rural areas with less marked decreases in burglary (2.7%) and aggravated assault (1.4%). (Urban crimes were down in the same classes.)

There was not too much change in the total number of crimes against the person and crimes with property as their object. When grouped, both reflect increases. Property crimes were up 1.9% while "personal" crimes were up 1% in the rural areas.

Here "rural" means areas outside the limits of cities (urban places—any incorporated place of 2,500 or more inhabitants). Such rural areas include "urbanized fringe" areas around cities. These fringe areas cannot be separately reported. They do not coincide with police jurisdictions and there are practical difficulties, including the defining of the boundaries of these growing communities.

Monthly Variation

People, not seasons, cause crimes. Different seasons, however, seem to motivate different crimes. Opportunity, social contacts, heat, cold, and other factors have been pointed out as probables by students of the seasonal variations in criminal activity.

Even though certain seasonal variations can be graphically demonstrated, there is no average day in the year that is crime free. In 1955, there were 3,767 offenses daily in July in the cities studied. The daily average in all other months was higher. In December, the highest month, the daily average was only 16.6% above that for

July, the low month. So, for every 100 crimes per day in July there were as many each day plus a few more in other months of the year.

One of the most marked seasonal variations is found in the major crime of negligent manslaughter, the killing of another by gross negligence. Criminal intent is not an element of this crime; rather it is the criminal carelessness of people that gives rise to such a crime. Most of these grow out of automobile "accidents" but only those deaths due to the gross negligence of some person other than the victim are classed under this crime.

Unlike other crimes against the person (murder, rape, and aggravated assault), negligent manslaughter is at its low during the warm months of the year but rises to a tremendous peak in December. Hazardous traffic conditions, including increased darkness, confront drivers in the month of December. Such crimes might be expected to continue into January but there is always a sharp drop in that month from the December peak.

Murder (including nonnegligent manslaughter) is generally a warm-weather crime. The months of July, August, and September had the highest average number of offenses in 1955. The high for the year, however, did not occur during that quarter. December was the high month for murder for the year 1955. Similar upswings in the murder curve occurred in 1950, 1951, and 1952; but only in 1951 was December the high month for the year.

Rape and aggravated assault, the other two crimes against the person, appear definitely as warm-weather crimes. In 1955, their high was in the third quarter (July, August, and September). The graphs for these crimes appear very similar to those for previous years.

Of the crimes against property, robbery and burglary present the most perfect picture of crimes which occur most frequently during the darker and colder months of the year, high during the first and last quarters, and low during the second and third quarters. Of the two remaining property crimes (auto theft and larceny), auto theft shows a strong upsurge from September to the end of the year with December the high month. Auto theft, however, drops back to below average in January and reaches its low during June and July. The curve for auto theft is fairly consistent from year to year. Larceny reached its peak in the last quarter of 1955 although its low for the year was in January. It went above average in April and then dropped back until the start of the strong rise in the latter part of the year. *Uniform Crime Reports.*

Fingerprint terminology

The fingerprint pattern shown below is a RIGHT SLANT LOOP of SIXTEEN COUNTS. It is considered a right slant loop because both ends of the "innermost recurving ridge" (12) enter and leave the pattern from the same side or right side in this instance. The pattern is a 16-count loop because SIXTEEN RIDGES cross an imaginary line between the DELTA (4) and the CORE (11) indicated by the broken line C-D. Neither the delta nor core are included in the count.

The names of the points indicated by numbers are:

1. Clockwise bifurcation (fork)
2. Counterclockwise bifurcation
3. Enclosure or island
4. "Delta"
5. Lower type line
6. Independent ridge
7. Dot or very short ridge
8. Broken ridge
9. Counterclockwise bifurcation
10. Spur
11. "Core"
12. Innermost recurving ridge
13. Island ridge
14. Ridge ending

Fingerprints are described by appropriate terms which describe ridge characteristics. Variations are unlimited in different patterns. Characteristics pointed out by numbered lines are described fully in text below.

The points named are not to be construed as the names of all points appearing in all types of fingerprint patterns. This particular pattern was chosen because it shows many common points used in identification and comparison, and it will help to familiarize the reader with technical terms.

The delta and core are arbitrary points selected in certain fingerprint patterns according to the type of pattern and very definite rules which apply to the science of classification. Their locations vary in different patterns according to the rules. (From Scott, Walter R.: *Fingerprint Mechanics.*)

News and Announcements

EDITOR'S NOTE: *Of special interest is the forthcoming Conference on SCIENCE VERSUS CRIME on Saturday, December 29, 1956, at the Hotel Statler, New York City, sponsored by the New York Institute of Criminology under the direction of Dean Donal E. J. MacNamara. The hotel has reserved the PENN-TOP Room (500 capacity) for this Conference which is being held under the auspices of the American Association for the Advancement of Science, Society for the Advancement of Criminology, Association for the Psychiatric Treatment of Offenders, and Institute for Research on Crime and Delinquency.*

Chairman:

Donal E. J. MacNamara, Dean, New York Institute of Criminology

Program Committee:

Dean MacNamara

Dr. Melitta Schmideberg, A. P. T. O.

Arthur Galligan, Esq., Secretary, Institute for Research on Crime and Delinquency

Dr. Herbert Bloch, Prof. of Sociology, at Brooklyn College

Dr. Albert Genua, Professor of Chemistry, State Teachers College, Westfield, Mass.

Publicity Committee:

Jack Sokol, A. P. T. O., Chairman
Gene Ann Condon, attorney, Secretary
Lee Lawder, editor, LAW AND ORDER
Arthur Galligan, attorney
Marjorie Bell

Schedule

Morning Session (9:00 a.m. to 12:00 Noon)

General Topic:

THE SOCIAL SCIENTIST'S APPROACH TO CRIME PHENOMENA

Discussion Leaders:

Dr. Schmideberg and Dr. Bloch

Speakers

Dr. Marcel Frym, Director of Criminological Research, Hacker Foundation: "Clinical and Practical Problems in the Rehabilitation of Convicted Offenders"

Dr. Hubert Howe, New York Academy of Medicine: "A Scientific Approach to the Narcotics Problem"

Dr. Forrester Washington, former Dean, Atlanta University School of Social Work: "Race and Crime"

Dr. Sydney Zebel, Professor of History, Rutgers University: "The Historian's Approach to Crime and Cognate Phenomena"

Dr. Albert Ellis, author of THE AMERICAN SEX TRAGEDY, and other books: "The Sexual Element in Non-sex Crimes"

Dean Donal E. J. MacNamara: "Crime Trends Under Democratic and Totalitarian Governments"

Dr. Nicholas Pansegrouw, Executive Director, Institute for Research on Crime and Delinquency, has been invited to speak on: "Climatological and Geographic Influences on Crime Patterns"

Luncheon Session:

Seminar on Science Versus Crime. Dean MacNamara, Presiding. Discussion Leaders and Speakers from both morning and afternoon sessions participating

Afternoon Session (2:00 p.m. to 6:00 p.m.)

General Topic:

SCIENTIFIC ADVANCES IN CRIMINAL INVESTIGATION

Discussion Leaders:

Dr. Genua (supra) and Chauncey Smith, President, N. Y. State Division, International Association for Identification

Speakers

Martin K. Tytell, Pearl Tytell, Examiners of Questioned Documents; Lecturers, New York University and Brooklyn College: "Exposing a Documentary Hoax"

Isaac Don Levine, author of STALIN'S GREAT SECRET: "Rebuttal"

Martin Luckens, State Toxicologist, State of Connecticut: "Chromatographic Techniques in a Crime Laboratory"

Cleve Backster, polygraph examiner; President, Backster Associates, Inc.: *"Scientific Advances in Interrogation: Instrumental, Hypnotic and Narcotic Techniques"*

Joseph J. Garbarino, Instructor, New York Institute of Criminology: "Effects of Alcohol on Driver Capacity: The Louisville Experiment"

Admission: Free

For further information, write to: Dean Donal E. J. MacNamara, New York Institute of Criminology, 40 East 40th Street, New York City 16.

Kansas City "Drivers Safety Workshop" for Teen-age Violators Proves Successful

Judge Henry A. Reideres of the juvenile court of Kansas City, Missouri reports that at the end of nearly two years of operation the "Drivers Safety Workshop," is a successful method of handling young traffic violators.

During the twenty months the Workshop has been operating, 487 boys and girls of juvenile age have been referred to the juvenile court for traffic violations. Of these, 382 referrals originated with the Kansas City, Missouri Police Department, 19 with the Independence, Missouri Police Department, 37 with Missouri State Highway Patrol, 20 with Jackson County Sheriff's Office and 29 from other sources. Of this total 462 agreed, with their parents' consent, to attend the workshop. Of the remaining 25, 20 were repeat cases (ineligible to attend again) while five were referred to the court. Of the 20 cases of second violations only 13 occurred subsequent to certification of the student by the school and the other seven second violations occurred in the interim between matriculation and completion of the "workshop" course of study.

The Workshop offers a course of instruction on problems relating to motor car driving, aimed particularly at juveniles who have been cited by law enforcement agencies for traffic violations. The course consists of five classroom sessions on rules of the road, laws and ordinances, and the driver's responsibility to society.

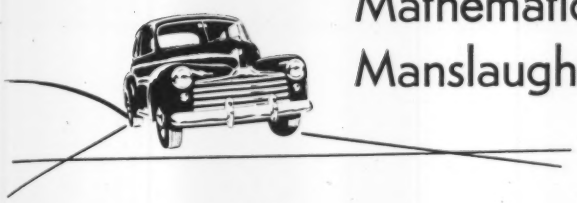
Juveniles referred to the court for the first traffic violations are given the opportunity to attend the workshop, thereby qualifying for a dismissal of the charges by the court providing they complete the course successfully, without record of adjudication of delinquency. The tuition is $10.00 per student and the workshop has proven to be self-supporting. The course is conducted by the Driver Training School of Greater Kansas City, a non-profit educational group directed by local high school teachers of Driver Education.

Police Photographers!!

You may already have that negative. If not, the opportunity for that picture may come your way as a part of the day's work. A two-week, expense-paid vacation for two at the Varadero Internacional, Cuba's luxurious new resort hotel, will be the grand prize in the 10th Annual Graflex Photo Contest which opened Nov. 1.

More than $10,000 in prizes will be awarded 70 other winners, it was announced. The Graflex Press Fellowship, a major feature of the contest, will be awarded to the outstanding winner among the younger entrants.

Entries will be accepted in six classes: news pictures, industrial, *professional*, non-professional, teen-age, and stereo. First prize in each class is a $500 U. S. Savings Bond. The news class is divided in two categories depending upon the size of the paper. The contest closes Jan. 1, 1957. Entry blanks may be obtained from local Graflex dealers or by writing: Contest Manager, Graflex, Inc., Rochester 8, N. Y.



Mathematical Methods Used in a Manslaughter-by-Automobile Case

By Conrad Rizer

EDITOR'S NOTE: *The application of scientific method is a characteristic of the march toward professionalization in the American police services. In the examination and resolution of evidence materials through the aid of the physical and biological sciences, the forces of law and order have made priceless gains during the past quarter century. Not the least among scientific procedures now at the disposal of police personnel in their service to the community and the people is the discipline of mathematics and through its application the tools and skills of the police are immeasurably sharpened, to mention only one illustration, in the field of traffic accident investigation. The case that follows is a typical example.*

The services of Dr. Rizer as an expert witness were retained by the prosecution in this manslaughter-by-automobile case. The evidence that he was able to present as a result of mathematical calculations proved to be unusual and was considered as materially aiding in a verdict of guilty against the defendant. Dr. Rizer is Head of the Department of Physics, Washington College, Chestertown, Maryland, and author of the book, Police Mathematics, *published 1955 as a part of the Police Science Series, by Charles C Thomas, Publisher.*

IN manslaughter-by-automobile cases the prosecution often has difficulty in proving that the defendant has been guilty of criminal negligence, especially if there are no witnesses. However, a scientific evaluation of such evidence as the width and length of skid marks, and an analysis of fibre, glass and paint fragments will usually result in bringing to light pertinent information about the accident. In a recent manslaughter case, the application of mathematical methods was the only way to interpret the major portion of the evidence and show that the car was traveling at an excessive rate of speed at the time of the accident.

THE ACCIDENT

A seventeen-year-old youth took an eighteen-year-old girl in his sports car to a dance one evening. The car was of a make noted for its exceptional speed and power. They drank moderately during the evening.[1] Soon after 1 A.M. they left the dance in the car and traveled at a slow rate of speed for a short distance until they came to a straightaway stretch of macadam highway 1.2 miles in length. The car was then observed to accelerate until it disappeared around a reverse curve at the end of the straightaway. Each half of the curve is 0.2 miles in length and the curvature gradual enough that cars may take the curve safely at 75 miles an hour.

Address: Dr. Conrad Rizer, Department of Physics, Washington College, Chestertown, Maryland.

Several minutes later when another couple leaving the dance by car had rounded the curve cited above they noticed skid marks in long arcs across the highway, a broken fence, and a car some distance away in a field—the headlights still on. They notified the state police who quickly answered the call. An ambulance also arrived. The girl was found lying in the field approximately half way between the fence and the car. She was mortally injured and died on the way to the hospital. The youth had managed to stay with the car and sustained only superficial injuries—mostly about the face.

APPLICATION OF MATHEMATICAL METHODS TO THE EVIDENCE

From a study of the evidence, it was apparent that the car had started to sideslip soon after completing the reverse turn, and continued sideslipping until it reached the fence. The course of the car could be traced by three skid marks. See diagram. The left front tire was innermost and sustained the least pressure. It left no skid mark. The right rear tire was outermost and sustained the greatest pressure. The normal contact width of the accident car's tires was 4.5 inches. The width of the right rear skid mark was 8 inches for the entire distance of 151 feet, that is, from A to C. From the curvilinear form of these skid marks the conclusion may be drawn that the car moved under a central force* as it careened across the highway.

Also, it was evident that the car had rotated as it sideslipped, the right side of the car being the one which was always forward. The angular position of the car at the two points indicated on the diagram can be determined by finding the angle between the car's tread—the distance between centers of the two rear wheels—and the right rear skid mark at the two points. At A the angle X is determined by means of the sine function of the angle, that is

$$\text{Sin } X = \frac{28 \text{ inches}}{50.5 \text{ inches}}$$
$$= .5545$$
$$X = 34^\circ$$

*A central force is one which is always directed toward or away from a fixed point.

[1] Seliger, Robert V.: Alcohol at the Wheel. *J. Criminal Law, Criminol. and Police Sc.*, *44*:402, Sept.-Oct., 1953.

28 inches being the distance between the right rear and left rear skid marks, and 50.5 inches the width of the car's tread.

In a similar way at the point opposite B, the corresponding angle Y is found from

$$\sin Y = \frac{12 \text{ inches}}{50.5 \text{ inches}}$$
$$= .2376$$
$$Y = 14°$$

12 inches being the distance between the right rear and left rear skid marks, and 50.5 inches the tread. Both angles have been rounded off to whole degrees. Thus the car rotated through 20° between the two points.

The speed of the car, based on evidence up to point C on the diagram, may be calculated in two ways:

First method—To find the speed at the start of the skid marks.

Using the equation[2] $V = 5.5\sqrt{fs}$

where V is the initial speed in miles per hour
f is the coefficient of friction[3] (.75)
s is the braking distance in feet (292)

the value of V is 81.4 miles per hour, assuming the car had come to rest at C, the edge of the pavement.

Second method—To find the average speed along the arc A C and at A and C.

This method is based on the fact that the central force on the car, as it skids along the arc A C, is balanced by the opposing frictional force. These forces are at right angles to the direction of motion. But before a value of the speed can be determined, it is necessary to calculate the radius of the curvature of the arc A C. The straight-line distance between A and C is 147 feet and the perpendicular distance from this straight line to the midpoint on the arc A C is 3 feet. Let the radius, R, to be found, be the hypotenuse of a right triangle; let $\frac{147}{2}$, or 73.5 feet be one leg of the triangle, and R − 3 the second leg. Then

$$R^2 = (73.5)^2 + (R - 3)^2$$
$$R = 900 \text{ ft.}$$

It is now possible to find the car's average speed, V, along the arc A C. The central force is

$$\frac{WV^2}{32.2R}$$

where W is weight of the car
32.2 is the gravitational constant of acceleration
R is the radius of the curvature of the arc

The frictional force is

$$Wf$$

where W is again the weight of the car and f is the coefficient of friction.

Equating these two expressions and solving for V^2

$$V^2 = 32.2\ fR$$

Substituting f = .75, R = 900 ft., and solving for V,

$$V = 147 \text{ ft. per sec., or } 100 \text{ mi. per hr.}^*$$

The speeds V_A and V_C at A and C respectively, are found by the use of simultaneous equations

$$V_A + V_C = 2V$$
$$V_A + V_C = 2 \times 147 \quad (1)$$

Also

$$V_A^2 - V_C^2 = 2fgs$$
$$V_A^2 - V_C^2 = 7293 \quad (2)$$

where f is coefficient of friction (.75)
g is 32.2 ft. per sec.[2]
s is 151 ft. (A to C)

Solving equations (1) and (2)

V_A = 159 ft. per sec., or 108 mi. per hr.
V_C = 135 ft. per sec., or 92 mi. per hr.

If the speed at C is considered as zero, then the speed at A is 58 mi. per hr., using the formula $V = 5.5\sqrt{fs}$, and the difference in speeds between A and C is 58 miles per hour. But if the speeds for these two points are calculated on the basis that the car's mean speed is 100 miles per hour, then the difference is only 16 mi. per hr., as calculated above. In general, the greater the mean speed for a given distance, the smaller will be the difference in the initial and final speeds.

These divergent values of the speeds calculated for A by the two methods raises the question of which method is the more reliable in this case. The first method used is the standard one for a car brought to a stop by using the brakes. Even though the brakes in the present case were of little use, there was effective braking in the sideslipping motion. The value of this method for a reliable estimate of the initial speed of the car is limited by the assumption that the car came to rest at C, and by the question of the value of S in the equation. However, it does afford a means of obtaining a very conservative estimate. Conversely, the second method is not limited by the above factors. The estimated speed at A is much nearer to the speed at the time the car went out of control. Also, with a knowledge of the speed at C, a more reliable evaluation of the evidence from C to E is possible. In general, this method is applicable only to a case in which the vehicle is altogether out of control and is moving in a curved path, as in the case under consideration.

When the car was observed by the police, a ruptured portion of the inner tube on the right front wheel was extruded between rim and tire. This injury must have taken place either at B or the fence.

The car continued on its undeviating course from the pavement to the fence, crossing a ditch 2.5 feet in depth with gradually sloping sides, as though it virtually was not there. The surface between the road and fence was grass covered.

At the fence each of the three skid marks ended in a churned up portion of earth and sod. Sixty feet of fence lay on the ground. It seemed to have been laid over by a force of gradually increasing intensity; not by a smashing impact. The fence bordered a field of tall grass. In this field, 50 feet from where the car crossed the fence, there was a large churned up area, D. The ground between the fence and D showed no evidence that the

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* Miles per hour = $\frac{15}{22}$ (feet per second).

[2] *Accident Investigation Manual.* Northwestern Traffic Institute, 1942, p. 98.

[3] *Ibid,* p. 101.

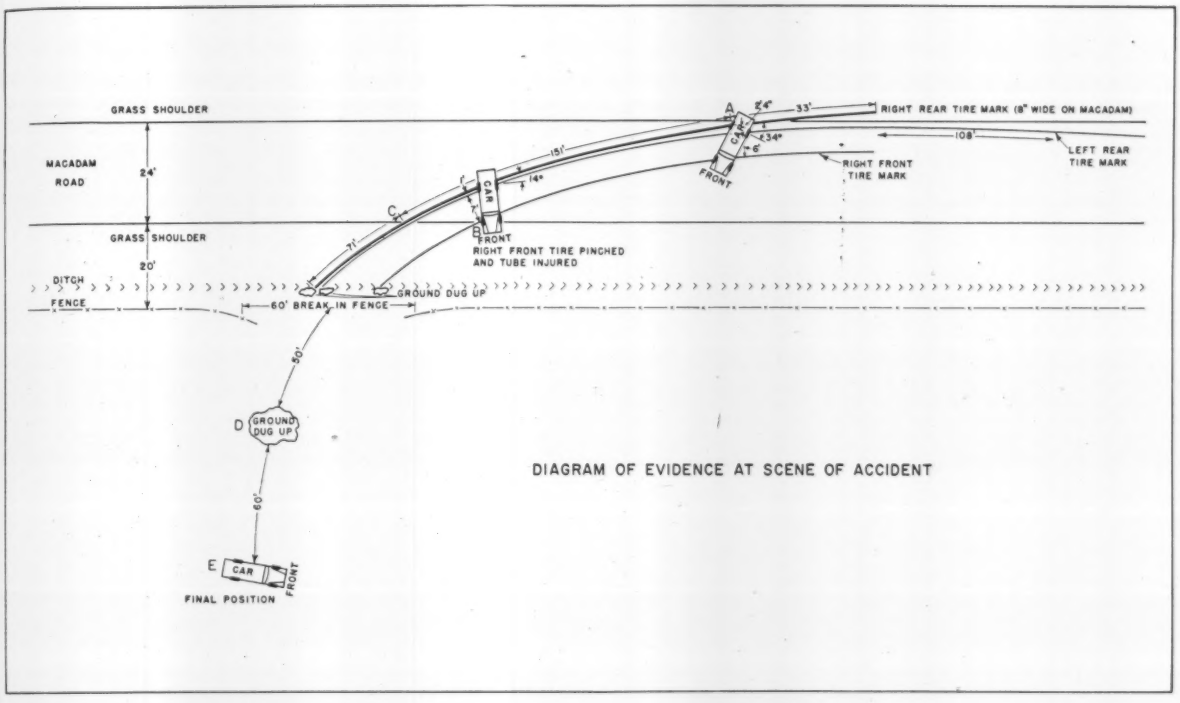

DIAGRAM OF EVIDENCE AT SCENE OF ACCIDENT

car had been in contact with it. Sixty feet beyond D the car came to a stop, right side up, resting on all four tires, having traveled a straight line course from the fence to E. It was facing in the opposite direction from which it had been traveling when it went out of control. The left side of the car was not injured, although the left half of the windshield was found near D. The right side and rear of the car were bashed in. The frame of the right half of the windshield still remained in place but it was badly bent and the glass shattered.

From the evidence at the fence,* it seems probable that the car approached the fence in such a way that the right front fender and wheel made first contact. As the force of the fender and wheel increased, the top of the fence began to bend back. This formed an incline on which the tire could begin to slide up. As the car kept pushing harder and harder, an extended length of 60 feet bent back. This afforded the car a ramp from which it took off into the air to land at D on its right side. The girl had no protection and was forcibly ejected from the car by the impact.

The speed which an object must have in order to jump a given distance or range depends on the angle of takeoff. The speed decreases as the angle increases from 0° to 45°. For angles from 45° to 90° the speed must increase. Thus, the minimum speed is for a 45° angle. Assuming that the car jumped from the fence to D, the minimum takeoff speed is found by means of the equation

$$X = \frac{V^2}{g} \sin 2\phi$$

where X is the distance jumped, 50 ft.
V is the speed
g is 32.2 ft. per sec.^{2} (gravity constant)
ø is angle of takeoff, 45°
Substituting values and solving
V = 40.1 ft. per sec., or 27.3 mi. per hr.

An angle of 45° seems quite improbable for the reason that the fence lay on the ground when observed by the police. Neither is it credible that the fence lay on the ground as the car passed over it. The car's oblique length was about one fourth that of the fence laid over. There was no evidence that the car had moved along the fence so as to push it over, but rather that it had behaved as described above. Thus it seems reasonable to assume that the car left the fence at a low angle, and with a speed much greater than 27 miles per hour.

SUMMARY

The distance between the end of the reverse curve and the skid marks was one tenth of a mile. From the beginning of the skid marks to E the car traveled at least 437 feet over continuously level surfaces except for the ditch and fence. The car traveled this distance in less than ten seconds. Undoubtedly the car lost speed between the time it went out of control and the start of the skid marks. Therefore, the original speed was above 108 miles per hour, the speed calculated for point A.

The mathematical methods applied in this article have included those used by the police and considered as standard. The new methods are suggested as additional aids in evaluating evidence in a manslaughter by automobile case.

*The fence was a "Maryland" type, 4.5 feet in height. This type consists of series of cross-bar panels in sturdy framing.

From the Editor

In 1955, 37,800 Americans were killed in traffic accidents.

In 1955, 2,158,000 persons were injured in motor vehicle accidents.

Speeding on U.S. streets and highways last year killed 12,700 men, women and children.

Speeding on U.S. streets and highways injured 702,560 men, women, and children.

In 1955, 8,130 pedestrians were killed in U.S. traffic accidents.

Weekend crashes accounted for 15,730 killed and 766,090 hurt during 1955.

More than 41% of the deaths and more than 35% of the injuries due to motor vehicle accidents last year occurred on Saturdays and Sundays.

Twenty-seven per cent of all drivers involved in fatal auto accidents in the U.S. last year were under 25 years of age.

Eighty-five per cent of the vehicles involved in accidents were passenger cars.

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Pictures can be made to lie—

On page 59, a picture is shown with the question: "Are these three men of equal height?"

Pictures can be made to show what the photographer wishes!

The first picture is a distortion obtained by shifting the camera angle, and by moving the middle man back six inches and the man on the right back twelve inches from the camera position, on an inclined plane.

This picture is a normal reproduction of the actual heights of the three men.

(Courtesy, Brooks Institute of Photography. From Houts, Marshall: *From Evidence to Proof.)*

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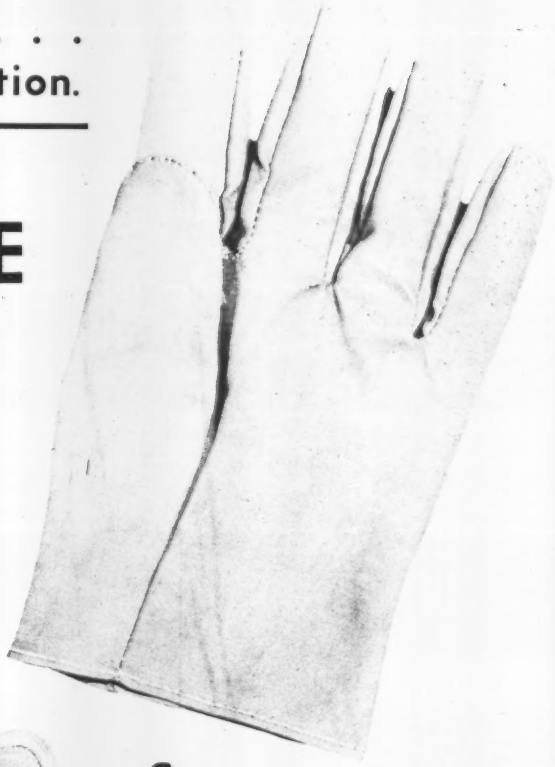

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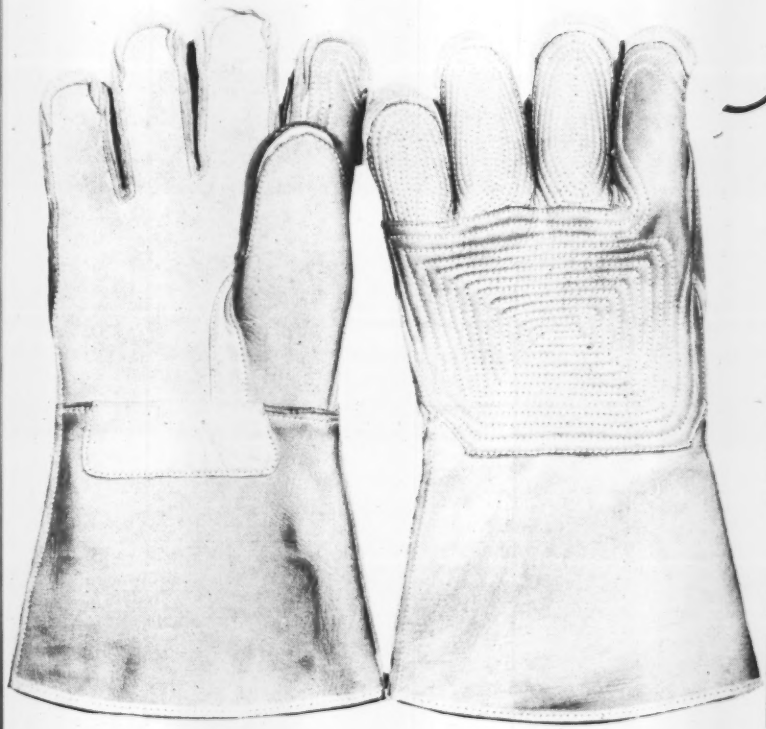

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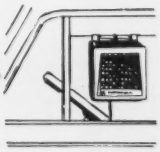

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